APR 15 1957

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VOL. LII NO. 4

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Veterinary Medicine

Established 1905

features in this issue...

Oil Field Problems

Treatment of Coccidiosis in Beef Cattle

Lymphocytic Choriomeningitis-like Virus from Cattle

Official Poultry Inspection

Hexylcaine and Procaine Hydrochloride on the Pudendal Nerve

Correction of Faulty Ear Carriage in the Dog

Chlorpromazine as a Preanesthetic and Tranquilizing Agent in Veterinary Medicine

Clinical Evaluation of Prednisone-Penicillin Combination

Veterinary Medicine in the South

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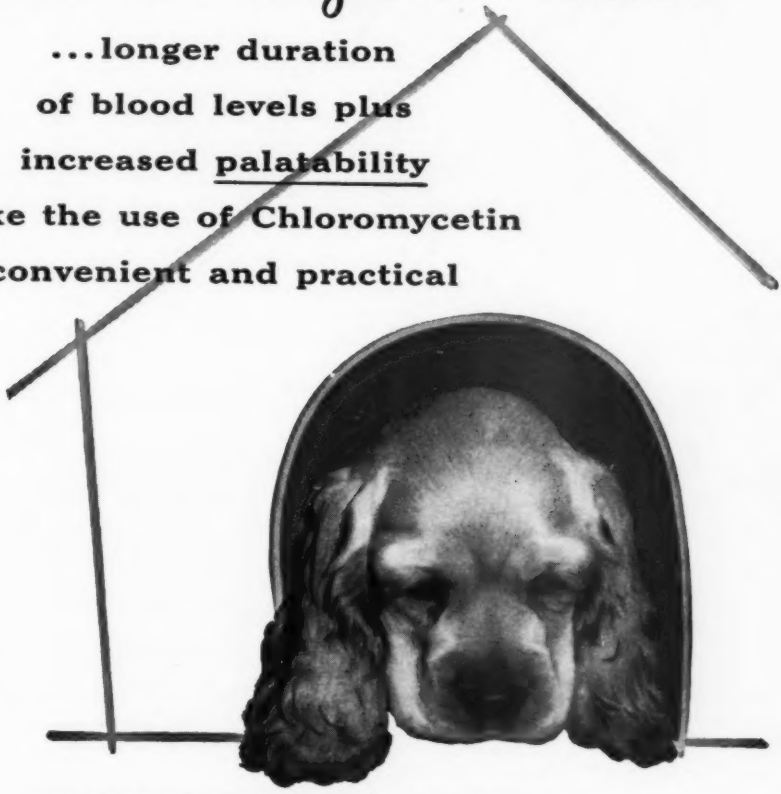

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Iowa Legislation Proposes Prohibition of Hog Cholera Virus

The Des Moines Register for Mar. 2, 1957 lists as passed by the Iowa House (H.F. 514), a measure which prohibits sale, distribution or offering for sale or distribution, virulent hog cholera virus (simultaneous virus).

Senate file 284, which was introduced by Senator Putney, amends chapter 166 of the 1954 Code of Iowa by repeal of sections which allows an owner to take a course of instruction and then vaccinate his own hogs. It also prohibits sale or distribution of virulent virus after Jan. 1, 1960. It appears that the author of this bill believes that the use of virulent virus and antiserum for the immunization of swine for cholera is no longer necessary.

Full debate and ultimate action by the Iowa legislature on a live virus bill is likely. A new measure prepared by the Agricultural Committee is expected to be presented to the General Assembly after its recess. It appears almost certain that some sort of restrictive legislation will be passed by that lawmaking body this year.

The general tone of opinions expressed thus far in Iowa forecast the end of a long held idea concerning control of this disease of swine as well as an era. It may prove to be a major forward step to eradication of hog cholera, the disease menace that has existed for over 100 years in this country and that has killed more hogs than any other. Iowa produces approximately 20% of the hogs in the United States. More vaccination products are used in this traditional hog state and a higher percentage of swine population are vaccinated with live virus and antiserum than any other state of the nation.

The proposed legislative action is a milestone in disease control, notwithstanding that several states have restricted sale of live virus for two or more years.

A bill has also been prepared and will be introduced soon in the U. S. Congress prohibiting the use of fully virulent virus after July 1, 1958. In the event this bill becomes a law, it will speed legislative action in all states.

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REFERENCES: 1. Mosier, J. E.: Vet. M. 50:605 (Nov.) 1955. 2. Belloff, G. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956. 3. Pollock, S.: J. Am. Vet. M. Ass. 129:274 (Sept.) 1956.

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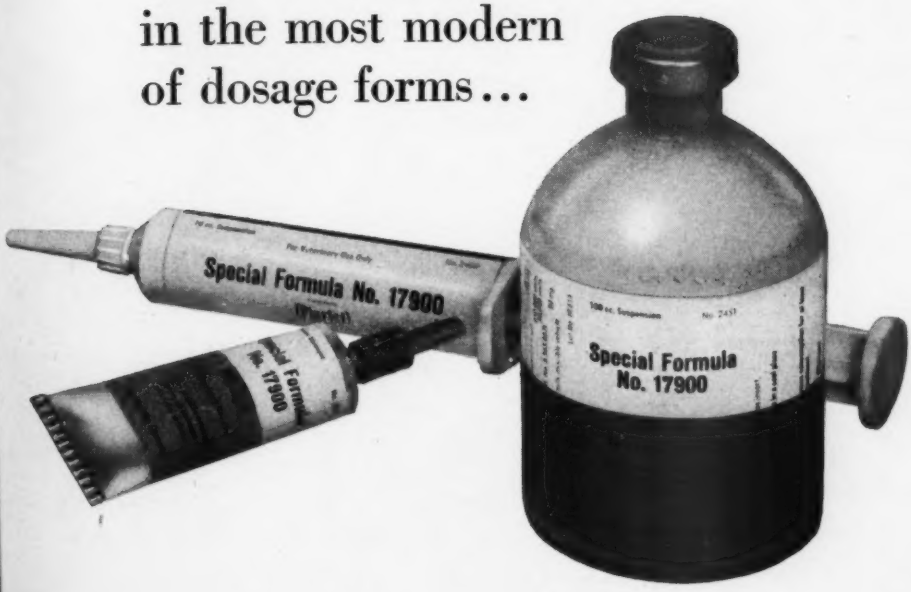

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McEachran, D.: Am. Vet. Rev. 3:102 (Jan.) 1879.

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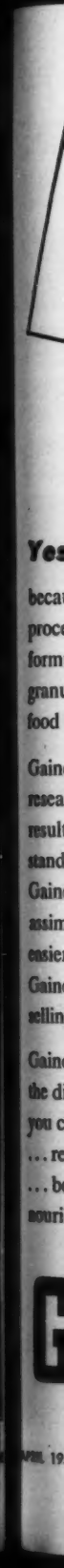

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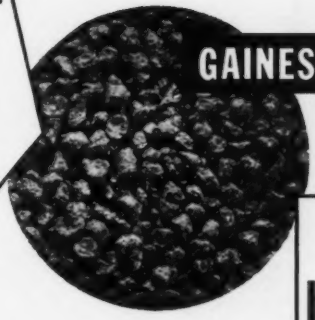

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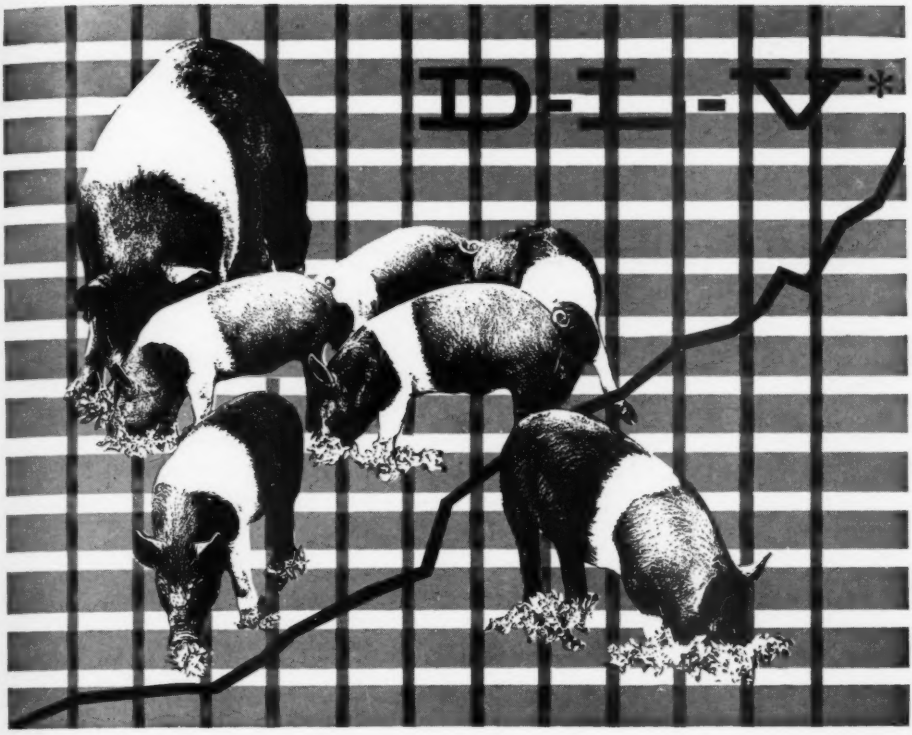

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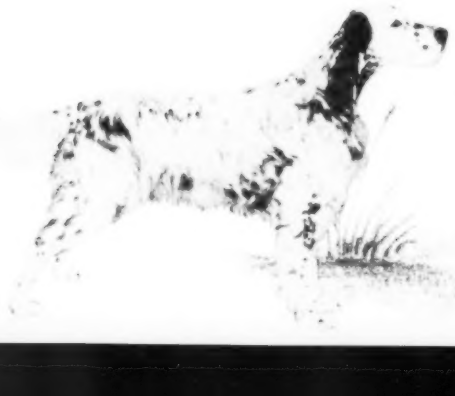

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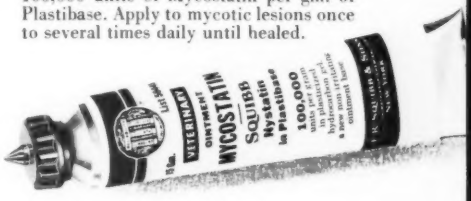

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Vitamin D_3	3,700 U.S.P. units per lb.	Calcium	7.7%
Vitamin B_1	18 mg. per lb.	Phosphorus	4.6%
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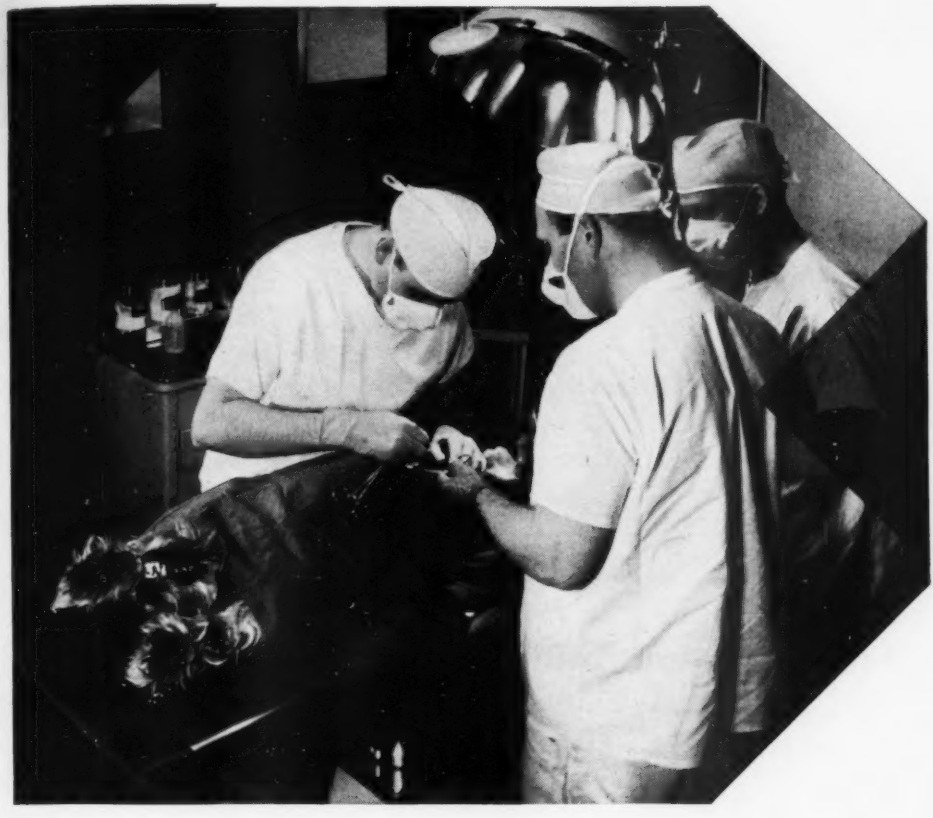

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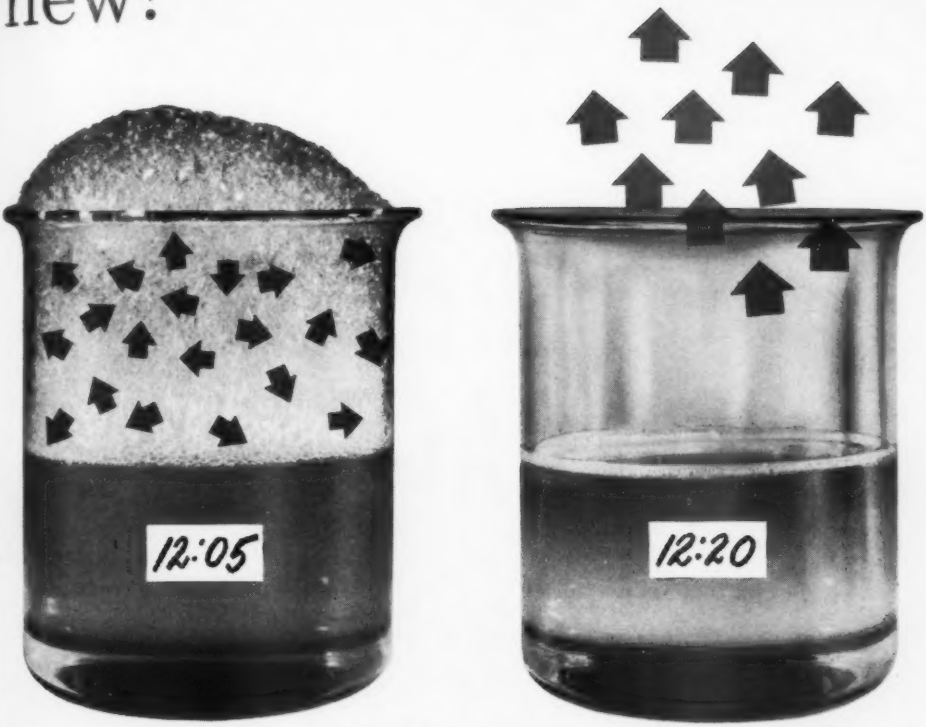

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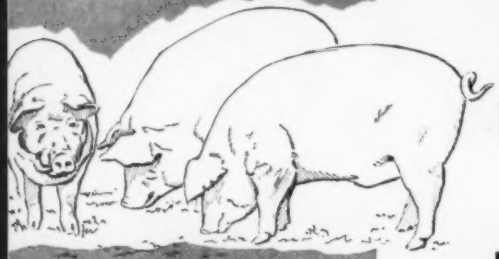

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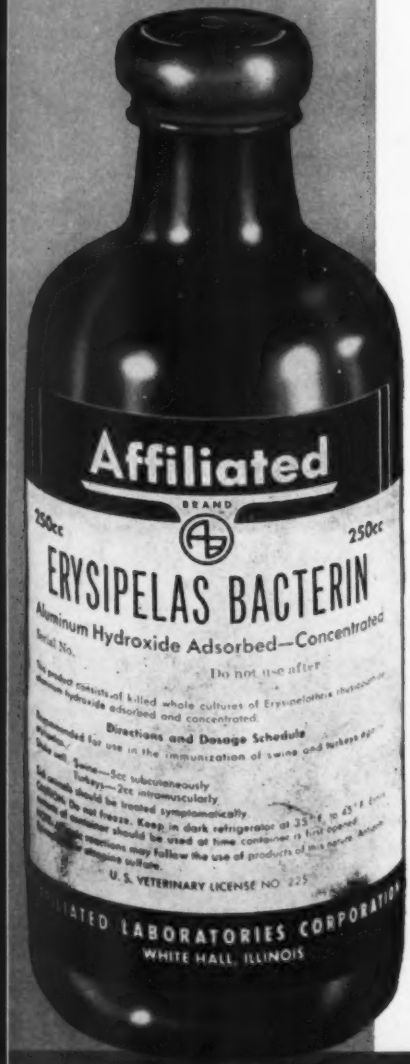

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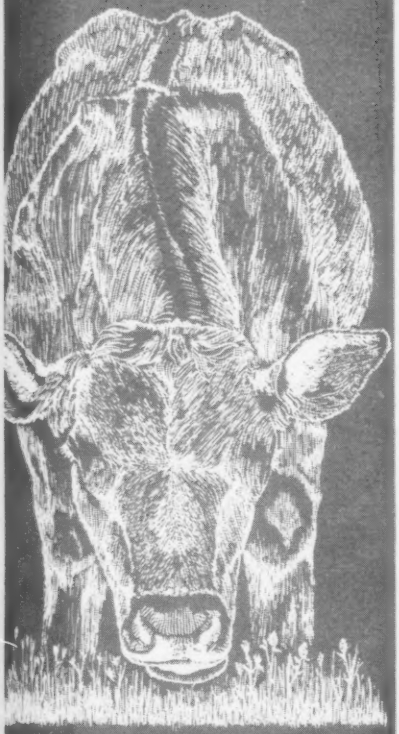

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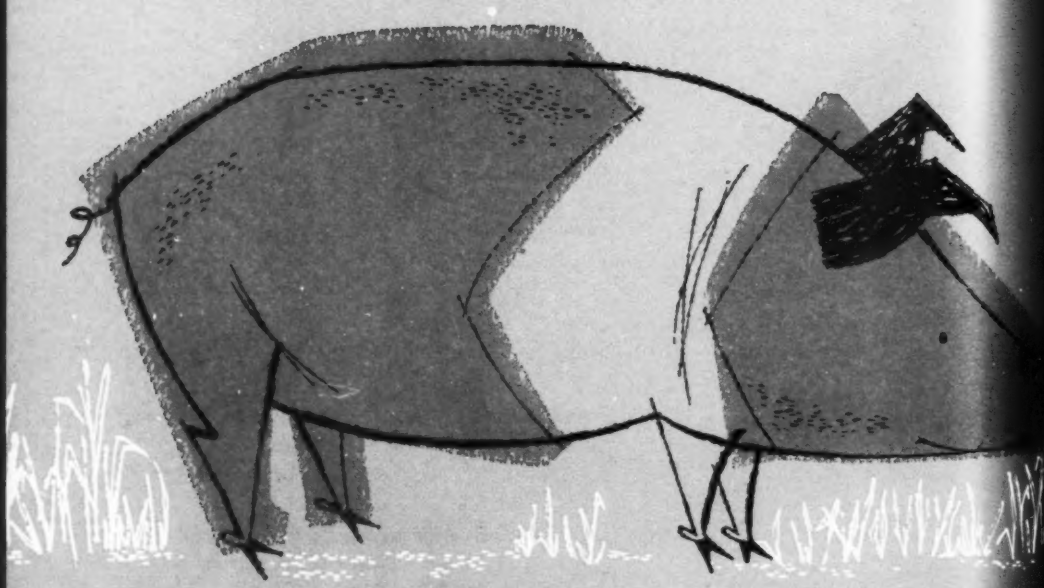

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This and other examples of industrialization are complicating livestock culture in many parts of the United States.

Oil Field Problems Confronting The Veterinarian

W. C. McCONNELL, D.V.M., Bartlesville, Oklahoma

VETERINARIANS are often called upon to examine and treat domestic livestock suspected or actually sick from drinking salt water, crude oil, oil residues, et cetera, from polluted streams, ponds, or land. In such instances veterinarians are called upon frequently as expert witnesses to help the courts determine the rights and liabilities of persons involved.

It is a well established principle of law that any person who permits poisonous substances or material of an infectious nature to enter a stream or a pond, thereby polluting the water, may be held liable for damages to the owners of animals down stream, if professional testimony establishes the fact. It is also a well established legal principle that any person who claims damages caused by water pollution is bound to prove with reasonable certainty that injury existed and that the damages actually were caused by water pollution. Courts have held that the party or parties responsible for polluting water are liable for damages even though such pollution does not result from negligence on their part.

It is axiomatic that while a property owner does not own the running water, he has the right to a reasonable use of it as it passes by his land. All other owners upon the same stream have the same right, and no one has an absolute right, but is qualified by the rights of the other owners to have the stream substantially preserved in its normal size, flow, and purity and to protect it against material and unreasonable diversion or pollution. The lower owner must submit to such loss or pollution caused by reasonable use.

Mineral Tolerances Variable

In many areas underground waters, and less often surface waters carry excessive amounts of dissolved minerals, frequently enough to be unpalatable or even dangerous to health. The U. S. Public Health Service has set up the following mineral tolerances for public supply of drinking water.

	Mandatory Upper Limits (p.p.m.)	Non-mandatory Upper Limits (p.p.m.)
Lead	.1	
Fluoride	1.5	
Arsenic	.05	
Selenium	.05	
Chromium (hexavalent)	.05	
Copper		3.0
Iron and manganese		.3
Magnesium		1.25
Zinc		.15
Chloride		250.00
Sulfate		250.00
Total solids desirable		500.00
Total solids permitted		1000.00

No generally accepted tolerance scale for minerals in drinking water for farm animals has been set up, but it may be assumed that for optimum performance mineral tolerance must be about the same as that recommended for human consumption. However, in many areas, water of this quality is not available at a practical cost. While livestock will not voluntarily choose highly saline water when better water is available, they can be forced to adjust themselves to much higher levels than recommended for best results. Cattlemen in Montana and Colorado consider a total solids content of 2,500 parts per million (p.p.m.) the maximum consistent with passable results. In western Australia where good water is unattainable, the upper limits considered safe are as follows:

Poultry	2,800 p.p.m.
Swine	4,200 p.p.m.
Horses	6,400 p.p.m.
Beef cattle	10,000 p.p.m.
Adult sheep, non-lactating	12,000 p.p.m.

It seems astonishing that animals can adjust themselves to these high levels of solids content. Of the physiological functions, lactation and reproduction are generally the first to be disturbed by the continuous intake of highly saline water. Milk and egg production may be much reduced or even terminated.[1]

The danger of excess toxic elements in deep well water is illustrated by a report of deaths from excessive fluoride in a well at Brittian, So. Dak.[2]

The writer practiced for many years in an area where there are a large number of producing oil and gas wells. It might be added that there were also a great number of salt water wells. During this time, the writer was called upon to examine and treat animals

Illustrating oil derrick, pump, and slush pond located in typical Oklahoma grazing area. Note improvised fence around oil installation. Sometimes inadequate maintainence of fences allows cattle to drink from this type of attractive nuisance.

suspected or actually poisoned by materials flowing or pumped from these wells.

In such cases, the total soluble salts present seems to be a more important factor in the livestock damage than the kind or kinds of salts present. Analysis reveals various saturations of sodium, calcium, magnesium chlorides, and sulfates, minor quantities of carbonates, bicarbonates, and even less quantities of other ions. Sodium chloride is somewhat less active than calcium chloride, and magnesium chloride is the most injurious; the injury coming, evidently, in the limited amount of water consumed by animals. The alkali solutions are more injurious than saline waters, the injury being more direct as a chronic enteritis.[5]

A salt content of 1.5% appears to be the maximum concentration of soluble salts that an animal can use with safety. For lactating animals the limit is lower. Sheep are more resistant than cattle and cattle more than hogs. Sheep have been able to exist on 2.5% sodium chloride and 2.0% magnesium sulfate solutions. Cattle, not in lactation, have maintained themselves on 2.0% sodium chloride.

The inability to suckle young is noted before injury to the mother is apparent. Dr. V. G. Heller, at Oklahoma A. & M. College, in his experiments on The Effects of Saline and Alkaline Waters on Domestic Livestock,[5] pointed out the interesting observation that in no case was abortion produced, although the cows were in advanced pregnancy. Calves were born at regular time and developed normally.

While the above observations have proved true in the writer's own experiences in so far as saline and alkaline waters were concerned, it is not true in the case of crude oil, oil residues, et cetera.

As a statement of fact, if livestock are well fed, accustomed to drinking fresh water, and have access to salt regularly, they will usually refuse to drink saline water in sufficient quantities to injure themselves, unless they are unaccustomed to oil field environment. If no other water is available and cattle are forced to drink much of the water due to its salt contion, they will be injured directly, or failing to drink much of the water due to its sale content, animals will develop a condition of partial starvation, so-called salt injury, due to an inadequate intake of food and water to supply their maintenance requirements. Consumption of food decreases as the water intake is decreased. As a result of such partial starvation, constipation, unthriftiness, and other symptoms develop. Unless animals are forced to drink saline waters until the parenchymatous tissues of vital organs are irreparably damaged, they usually return to normal when given normal drinking water.

Dr. W. C. McConnell

Recently retired from the extensive general practice he conducted in Holdenville, Okla., for 41 years, Doctor McConnell is now living at Bartlesville, Okla.

The accompanying is a brief condensation of many years of study and observations of some incompatibilities existing between the livestock and oil industries. During his private practice career, his area of operation has been the site of amazing development of oil resources. Rapid development of oil fields over the grazing lands of cattle and sheep created, in some instances, unexpected hazards for which no precedence had been established. Resourcefulness of Doctor McConnell was demonstrated when he was called upon by livestock owners to determine hazards of an instance of industrialization to livestock culture. Solution to the problem required diligent application, and study of symptoms of those ill, claimed poisoned, and those found dead in the fields or near streams.

His long experience as the local practitioner with oil field problems is considered a valuable practical contribution.

Symptoms of Common Oil Field Poisoned Cases

The symptoms of salt water poisoning vary somewhat, but in general are observed as follows: Great thirst, abdominal pain, diarrhea, gaunt appearance, poor appetite, redness and dryness of the mouth, polyuria, diminished milk flow, and partial or complete blindness. The nervous symptoms are indicated by a depressing action on the central nervous system including weakness, paralysis of hindlegs, weak and rapid pulse, labored breathing, trembling, general paralysis, coma, and death. The latter occurs as a result of dehydration of body tissues.

In addition to many of the above symptoms,

swine often exhibit profuse salivation, intense thirst, purging, vomiting, extreme nervousness, convulsions, champing of the jaws, sometimes walking in circles, blindness, pressing head against solid objects, and evidence of pain as a result of the irritation of the kidneys and bladder; temperature remains unchanged. The ultimate cause of death is asphyxia.

In acute salt water poisoning, postmortem lesions include slight congestion of the entire digestive tract. Mucosa of the abomasum in cattle and stomach in hogs is swollen. Marked edema of the first portion of the small intestines which is usually empty, is revealed upon necropsy; lymph glands and spleen are usually normal, there is some congestion of the parenchymatous tissues of other vital organs, marked engorgement of subcutaneous vessels, bladder distended and mucous membranes hyperemic; kidneys are enlarged, deep red, and the capsule adherent and arteries and veins hyperemic. Blood may be bright red and thin. If death following poisoning is rapid, postmortem findings are not always pronounced.

In cases of continuous salt water poisoning, autospy may reveal hardening of the liver, small kidneys and adherent capsule, cystitis, hypertropic spleen, and chronic gastroenteritis.

Treatment consists of liberal amounts of water to overcome dehydration and eliminate salt in the urine. Mucilages, vegetable and mineral oils, are given orally and camphorated oil is injected intramuscularly. Spirits of ammonia and other stimulants may be employed as indicated. Calcium gluconate has been recommended by Wautie.[4]

Ordinarily crude oil is only injurious when consumed in large quantities or when it contacts a large surface of the body. Not infrequently a certain number of cattle in large herds will deliberately consume crude oil, high test gasoline, and petroleum products. The more recently the crude oil has been produced, the more volatile constituents it contains, and if much is consumed animals become intoxicated, may or may not regurgitate oil, and succumb suddenly of peracute bloat. Sudden death is due primarily to the rapid expansion of the highly volatile constituents.

Pupils are dilated, heart beats and respiration are accelerated, and temperature is elevated usually. Oil is frequently detected around the muzzle and anal region, as well as blotches over the body surface, where switched by the tail, by walking in the oil, rubbing against each other, or by other means of contact. Crude oil is detected in the feces, urine is dark, scanty and malodorous. Muscular incoordination developes, which is followed by death. Mild cases usually recover but do not make profitable gains.

Postmortem examination reveals a high state of inflammation and thickening of the mucous membranes of all sections of the intestinal tract. The kidneys are hemorrhagic, the bladder is markedly inflamed and thickened, liver is highly inflamed, spleen is somewhat atrophied and hardened, and usually there is congestion of the thoracic organs; in some cases pneumonia may be observed.

Treatment

Treatment for oil poisoning consists in the early use of the stomach tube, rumen evacuants (hypodermic and oral), digestive stimulants, calcium gluconate, dextrose, and heart stimulants. Bran and oats diet with small amounts of prairie hay is recommended.

Heavy Metal Poisoning

Another problem sometimes met with in the oil fields is heavy metal poisoning, principally lead poisoning from discarded containers, paint, pipe joint compound, and similar products. Ruminants lick these heavy metal poisons because of their salty taste. Lead and lead compounds in contact with the mucous membranes act as corrosives. After absorption lead acts as an irritant to the nerve centers, particularly upon the phychic and the motor centers of the cortex of the cerebral hemisphere and upon the vasomoter centers. It causes atrophy of the peripheral motor never endings which results in paralysis of striated muscles.

In acute poisoning the abomasum and small intestines may be extremely hemorrhagic. Marked degeneration of the liver resulting in a yellowing may be noted. The degree of acuteness would control the amount of liver change. Calves frequently display excitable symptoms such as muscular spasms, champing of the jaws, staggering, blindness, rolling of the eyes, frothing at the mouth, or an over abundance of saliva. The calf may show lack of appetite, colic, and constipation, followed by diarrhea due to mucosal irritation. A period of stimulation or excitement can bring about the nervous reactions described previously. The temperature may be elevated.

The use of monocalcium disodium ethylene diamine tetra-acetic acid ($CaNa_2$ EDTA, commonly called calcium EDTA) has been meeting with success in the field of veterinary med-

icine as well as human medicine. The calcium ion in the presence of heavy metals sets up a chemical reaction which releases the calcium and securely binds the heavy metal ion, thus eliminating its toxicity. The lead compound is eventually given off in the urine.

Oil well products and residues seem to have a definite attraction to most species of domestic animals. Therefore, oil companies or lease operators are usually careful with their lines and ponds to avoid legal complications. On the other hand some owners always want someone else to pay for their losses and are just waiting to collect indemnity from an oil company. It is a delicate job for the veterinarian, and he should be prepared to prove all statements indicating cause of symptoms and lesion revealed by careful examination and autopsy.

The composition of crude oil from the same source varies from day to day and differs greatly in different parts of the world. For the crude oil in the Oklahoma and Texas areas, Brooks points out that the volatile ingredients are of the methane series. Henderson and Haggard suggest that only the volatile constituents are apt to be toxic. No ill effect has been noted after exposure to these volatile ingredients for several hours. If substantial amounts of sulfur are present (1 or 2%) as hydrogen sulfide, toxic symptoms develop. Crude oil would not be a safe laxative. Apparently the principal harm would develop from the sulfur compounds. These facts should be demonstrated as the basis for court testimony.[5]

When a veterinary practitioner is called upon to investigate suspected pollution cases, he should obtain a complete history of the illness and ascertain under what circumstances it occurred. Thorough clinical examination of any sick animal is indicated, and a comprehensive inspection of the premises involved must be made. Samples of suspected water and oil for chemical analysis must be secured. A necessary adjunct is postmortem examination of all animals recently dead with attention to obtaining blood samples, sections of organs and intestinal fluids for future analysis, or microscopic examination if the circumstances warrant such further tests.

Armed with the information obtained as the result of the above procedures, the practitioner can correctly and confidently inform his client of the cause of the trouble. Should the case be one of pollution and be taken to court and the veterinarian employed as an expert witness, he can give testimony that would be difficult to refute.

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▼ ▼ ▼

More on Penicillin for Bloat Control

The routine use of an additive, like penicillin, to cattle feed as a bloat control measure, may have interesting possibilities in practical feed lots.

Last year, Barrentine of Mississippi, reported that 50-75 mg. of penicillin per head per day (administered in capsules) could prevent the development of bloat on bloat-producing legume pastures. Since then more work has been done along these lines. Most of it suggests that the practice has some possibilities.

At the Cornell Nutrition Conference this past November, Barrentine reported that his most recent tests show that 100 mg. per head per day is a more effective level than the 50-75 mg. reported earlier. In addition, 50 mg. of penicillin per ounce of salts seemed to be as effective as adding the penicillin to the feed.

To date, there has been no approval by the Food and Drug Administration for the routine use of penicillin in formula feeds for bloat control. Veterinarians may, however, dispense it if they so chose. With the approaching pasture season, some practitioners may have the opportunity to use this procedure in problem herds. It would be helpful to have reports of such trials.

One of the most tragic losses in this bloat problem is the removal of cattle from lush pastures. Cattlemen who suffer some bloat losses, hesitate to use them in their feeding programs. This may be more costly over an extended period than the death of one or two head.

To date, no apparent harmful effects from the use of penicillin in this manner have been reported.

Further experience in the field will indicate whether the procedure is entirely without danger. If this proves to be safe and as effective as has been reported, we will have moved forward in livestock nutrition. The cattlemen will be encouraged to utilize legume pastures more fully than he may have been inclined to do in the past.—*Morris Erdheim, D.V.M.*

Building that houses the veterinary laboratory on the Wyoming Hereford Ranch near Cheyenne.

Treatment Of Coccidiosis In Beef Cattle

E. D. BARROWS,* D.V.M., Cheyenne, Wyoming

DURING the past four years we have observed 50 cases of severe intermittent bloody diarrhea in yearling bulls and two-year-old heifers being fed for show purposes. Diagnosis of coccidiosis was confirmed by microscopic examination of fecal smears. The condition was noted in heifers mainly from March through the middle of June and in bulls during June and July.

Although death loss due to this parasitic disease is an important consideration generally, our main concern is the loss of weight and condition along with the loss of feeding time. Efforts have been directed toward effecting as rapid recovery as possible.

Ordinarily, the first sign of an outbreak is a small amount of bright red blood in the droppings. Usually within 12 to 24 hours an animal showing this symptom will be passing almost entirely blood from the rectum. In a few animals, this may be preceded by a thin, watery, profuse diarrhea.

Most animals go completely off feed at about the time the bloody diarrhea begins. A few will continue to eat through the entire course of the disease but with greatly diminished appetites. Temperatures rarely go over 103 F. and in some cases may be subnormal for brief periods.

The bright red blood noticed in the early stages becomes almost black during the second 24 hours. During convalescence and recovery feces are at first black and tarry. Still later, after the feces have become normal in consistency, they may exhibit a definite green color. Laboratory reports on the green feces have been negative for occult blood.

We have used almost as many treatments as we have had cases in attempting to find one which will be effective. Originally, our treatment consisted in administration of bismuth, sulfonamides and mineral oil by mouth. We

*Resident Veterinarian, Wyoming Hereford Ranch.

Monument honoring Prince Domino, a celebrated Hereford bull responsible not only for Wyoming Hereford Ranch fame, but also to an extent for the Hereford breed in general.

mixed these materials in varying amounts and proportions. Concomitant with this oral medication, we used enemas of sulfonamides, resorcin, and tannic acid. These were used also in a multitude of diverse formulations. On this treatment some of the animals in several groups recovered in an average time of 10 to 14 days, but three died on this regime. Ten animals in one lot were given 10 gm. of dihydrostreptomycin intramuscularly and 5 gm. orally. In at least two instances recovery was dramatic. Except for these two cases, recovery time averaged seven to ten days. Although results in general with dihydrostreptomycin were better than with the oral-rectal sulfonamide combination, they still left much to be desired. We then treated some 20 cases with terramycin®[1] by different routes; intravenous, intramuscular, and intraperitoneal. Although we have had extremely good results using oral terramycin in scours and bloody scours of calves, the same results were not obtained using this product in the present bloody diarrhea of older animals. However, terramycin intramuscular, intravenous, or intraperitoneal produced better results than any treatment we have used to date.

Eight yearling bulls passing profuse, black, thin, tarry feces were given 0.5 gm. daily for five days of intramuscular terramycin deep into the gluteal region. No other medicament was used. Improvement was gradual but steady. All animals were back on feed in five to seven days.

Six yearling bulls were treated with intramuscular terramycin, 0.5 gm. daily for five days, with results similar to the eight noted above. With a dose of 1 gm., recovery occurred in only three days.

Various other dosages of this antibiotic by different routes also proved effective. By continuing our trials we have developed a satisfactory routine for treating these cases of bloody scours or coccidiosis with terramycin. We dissolve 2.5 gm. of intravenous terramycin in one liter of aminosol®[2]. This is given either intravenously or intraperitoneally, but we prefer intravenous if the patient can be restrained easily. Little attention is paid to speed of injection. Immediately following this 1 gr. of sulfathiazole per lb. of body weight is given orally. Twenty four hours later repeat the sulfathiazole reduced by one-third and 24 hours

®[1]Chas. Pfizer & Co., Brooklyn, N. Y. Supplied through the courtesy of Dr. Gail E. Hawley.
®[2]Abbott Laboratories, North Chicago, Ill.

The latest modern equipment in a well lighted laboratory. Dr. E. D. Barrows, resident veterinarian, does his own laboratory analysis.

Part of the 1956 bull sale group. Wyoming Hereford Ranch showbarn no. 2 in background.

after that sulfathiazole reduced again by one-third.

In a trial with 13 animals, ten were back on full feed on the third day. Two required a second administration of 2.5 gm. of terramycin without the sulfathiazole on the third day. One required a third treatment of terramycin on the sixth day. In all three animals requiring treatment, even though the bloody diarrhea continued through the sixth day, animals were back on full feed on the fourth day.

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Editor's Note: *As we go to press with this article by Doctor Barrows, resident veterinarian of the Wyoming Hereford Ranch, we are advised that the entire holdings (land and cattle) have been sold. The new owners are Mr. G. C. Parker of Tulsa, Okla., and Mr. T. E. Leavey of Los Angeles, Calif.*

The new owners have announced that Mr. Geo. C. Lazear II, the present manager, will continue in that position. He is the son of the late R. W. Lazear, WHR manager for some 37 years, who suffered a fatal heart attack on Jan. 25, 1957.

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Radiological Defense Course

The Agricultural Research Service, with assistance of the Federal Civil Defense Administration, Atomic Energy Commission, and Department of Defense, is holding a series of regional meetings during April and May. The purpose of the meetings is to give veterinarians basic information about radiation, provide an opportunity to use radiation detection instruments and discuss problems relating to fallout or other contaminating radioactive material.

The increased attention now being given to the use of radioactive materials for energy, food preservation, research, and national defense may result in problems for all veterinarians. These meetings will provide each veterinarian participating with enough information on the subject to understand the nature of radiation problems and the measures that can be taken to protect animals and foods against contamination from this source.

Each meeting will require two and one-half days with an evening session for the entire group on the first day.

Federal, state and local veterinarians representing meat inspection, animal disease control, public health, and the military are invited to participate. There will be an opportunity for discussion of the problems in these fields of activity during the meeting. State and local veterinary organizations, veterinary departments of colleges, and other agencies are also being invited to attend.

Date	Location	Official in Charge of Local Arrangements
April 1-3	Room 705, 45 Broadway, New York 6, N. Y.	Dr. Meier Brodner Meat Inspection Branch, ARS Room 505, 45 Broadway New York 6, N. Y.
April 3-5	Red Cross Building 8th and Sycamore Streets Cincinnati, Ohio	Dr. M. R. Sebright Meat Inspection Branch, ARS 3129 Spring Grove Avenue Cincinnati 25, Ohio
April 8-10	Federal Office Building 911 Walnut Street Kansas City, Mo.	Dr. R. B. Briney Meat Inspection Branch, ARS 23 Federal Building Kansas City 10, Kan.
April 10-12	Building T-1114 Fort McPherson Atlanta, Ga.	Dr. C. J. Mikel Animal Disease Eradication Branch, ARS 614 Atlanta National Bldg. 50 Whitehall Street, S. W. Atlanta 3, Ga.
April 22-24	Peters Hall Auditorium School of Veterinary Medicine University of Minnesota St. Paul 1, Minn.	Dr. C. A. Ward Meat Inspection Branch, ARS P. O. Box 537 (Office—205 Post Office Building) South St. Paul, Minn.
April 24-26	Auditorium, Interior Building Lloyd Boulevard Portland, Ore.	Dr. M. M. Woods Meat Inspection Branch, ARS 105 U. S. Court House (Old) Portland 4, Ore.
April 29-May 1	U. S. Post Office and Court House 312 North Spring Los Angeles, Calif.	Dr. A. F. Eckert Meat Inspection Branch, ARS 1525 U. S. Post Office and Courthouse Los Angeles 12, Calif.
May 1-3	GSA Building 300 West Vickery Fort Worth, Tex.	Dr. F. W. Crawford Meat Inspection Branch, ARS 315 U. S. Court House Fort Worth 2, Tex.

Preliminary Investigations With A Lymphocytic Choriomeningitis-Like Virus Recovered From Cattle

S. H. RICHARDS,* B.S., and D. F. EVELETH,**
Ph.D., D.V.M., Fargo, North Dakota

LYMPHOCYTIC choriomeningitis in man and lower animals is a viral infection of the central nervous system, meninges, and choriod plexus. It is characterized by a wide diversity of symptoms between species.

Armstrong and Lillie[1] discovered the virus in monkeys while carrying on studies of St. Louis encephalitis. Traub[2] showed that this virus is harbored by albino mice and can be fatal to them. Rivers and Scott[3] recovered the virus from the cerebrospinal fluid of man. Armstrong and Sweet[4] reported the isolation of this virus from the house mouse *(Mus musculus)* in houses where human beings were suffering from the disease. Alice and McNutt[5] recovered the virus from a guinea pig previously injected with a brain suspension from a cow.

Three heads of cattle suspected of having rabies were submitted to the Veterinary Science Department for diagnosis. Each proved to be negative for Negri bodies and for rabies by intracerebral injection of mice.

Case Histories

Case 1. (Jan. 27, 1955—Robinson, N. D.) A steer developed symptoms similar to rabies. The animal was ill five days before death during which time it bellowed constantly, salivated profusely, and staggered around its stall. It refused to eat or drink and kept opening its mouth as though to dislodge something from its throat.

Case 2. (Feb. 3, 1955) A second steer from the same stall had similar symptoms and also developed stiffness of the hind quarters followed by incoordination and tremors of the head and shoulders. Death occurred after seven days.

Approximately 35 days prior to illness in the first animal, a sick skunk, *(Mephitis mephitis)*, had been found in the stall with these two cattle. The skunk had not shown any aggressive symptoms, but appeared to be severely ill. It was destroyed and buried. None of the cattle in other stalls in the barn sickened.

Case 3. (July 22, 1955—Sheyenne, N. D.) A cow became ill suddenly and bellowed constantly for a week before dying. She slobbered continually, was in heat, and was not aggressive. A sick skunk had been killed in the barn about a month previously.

The three cattle had inflammation of the meninges and congestion of brain tissues. There was a considerable amount of fluid in the ventricles of each.

Experimental Evidence

Six mice were injected intracerebrally with a brain tissue inoculum from the first steer. None of the mice developed symptoms of rabies and all were destroyed after 30 days.

Six other mice were given fluid from the ventricles. This fluid was frozen solid when first removed. Seven days after the injection, one mouse became sick and died two days later. The rest developed symptoms and all died by the 14th day.

Symptoms in the mice differed from those typical of rabies by the absence of paralysis in the hind quarters. Extreme weakness was noted, making movements difficult, but each animal was able to move when touched. Tremors which covered the anterior half of the body increased in intensity on the second day of symptoms. This was most pronounced in the fore-limbs and ears.

When suspended by the tail, the mice exhibited a series of contractions and tonic extensions of the hind quarters that were similar to those described by previous investigators for lymphocytic choriomeningitis. Death followed shortly after these extensions in some of the mice, but not in others. All developed a

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purulent discharge from the mouth and anus during the last day of life. This discharge was found in greatest quantity on the lower jaw, neck, and front legs of each mouse.

Upon examination, the liver and kidneys were found to be greatly enlarged. The lungs and spleen appeared normal while the liver appeared to be light brown in color. No evidence of enteritis was noted. Congestion of the choriod plexus and meninges was observed.

A brain tissue inoculum from the mice, treated beforehand with antibiotics, was injected into the metatarsal pad of two guinea pigs, one, a juvenile, four weeks of age; the other an adult female.

First symptoms in the immature guinea pig were characterized by a rough coat, loss of appetite and some weakness of the hind quarters. These signs developed on the ninth day following injection. From then until death, five days later, the animal lost weight rapidly.

Symptoms were first evident in the adult guinea pig on the 17th day post injection. The animal died eight days later with a purulent discharge from the mouth and anus. Examination of the viscera of both animals revealed no enteritis or peritonitis.

Six, nine-month-old mice injected with fluids from the brain of cow no. 3, developed symptoms in 28 days. These symptoms corresponded with the first group of mice described previously. A guinea pig injected by the metatarsal pad route with some of this fluid from the cow, developed symptoms after a 21 day incubation period. Refusal to eat was followed by steadily declining weight, rough fur, extreme weakness in the hind quarters and a purulent discharge from oral and anal orifices. Death occurred on the 28th day.

A raccoon (*Procyon lotor*) was injected in the sole pads of the hind feet with 1 cc. of inocula consisting of emulsified mouse brain and spleen. The mouse brain and spleen inocula were administered separately; the brain to the right foot and the spleen to the left.

There was a 24 day incubation period before symptoms appeared. The animal acted sick and refused to eat. Its rear leg became lame. On the second day of symptoms, weakness of the hind quarters was evident as the raccoon was obligated to stand with its feet far apart and in opposite directions. On succeeding days, the weakness disappeared and tremors of the feet and forequarters developed in a manner similar to the mice. The weakness returned and tremors increased in intensity until all parts of the body were affected. During the last stages, the raccoon lay on its belly with its nose through the floor mesh and its tail continually spinning in a circular motion. At no time did paralysis develop. The animal died seven days after the onset of symptoms.

On examination of the viscera an absence of either enteritis or peritonitis was noted. The spleen and liver were enlarged and the kidneys appeared inflamed. Meninges were congested and there was considerable fluid present in the ventricles.

Discussion

A virus, that originated in cattle, produced typical symptoms for lymphocytic choriomeningitis (LCM) in both mice and guinea pigs. Dalldorf[6] showed the LCM virus was present with the virus of Carré in inocula he passed to dogs and monkeys. It is conceivable that such conditions might exist here also. However, he was able to demonstrate the presence of two viruses while this investigation has produced only one.

Lymphocytic choriomeningitis might also exist as a latent infection in the test animals. None of the guinea pigs or mice from our stock supply have shown symptoms of, or died from LCM previous to or during these experiments. Those animals that were injected with the bovine inocula were kept on the third floor while the stock colony is located on the first floor of the laboratory.

In order to further test the possibility of latent infection, the mice that were injected with the cow brain material (animal no. 3) were obtained from another department in another building. Typical symptoms were produced here also.

Many cattle submitted for rabies diagnosis prior to the three under discussion here had been tested by mouse inoculation. None of them produced lymphocytic choriomeningitis in the test animals even when fluid present in the brain cavity and adhering to brain tissue was included in these inoculations. Large amounts of fluid as was found in the ventricles of the cattle producing LCM was absent from other cases suspect of having rabies.

McNutt[7] showed that sporadic bovine encephalomyelitis causes peritonitis in guinea pigs; none of which was present in our experimental animals. His description of typical symptoms for this disease in cattle includes depression and absence of excitation such as is not often characteristic for rabies. Such symptoms are directly opposite to those found in these three cattle.

(Continued on page 174)

Three major mandatory poultry inspection bills have been introduced in the United States Senate. They are the Aiken bill (S. 313); the Talmadge bill (S. 645), and the Humphrey bill (S. 1128).

All three measures are similar — some sections identical. The Humphrey bill alone provides for an effective system of mandatory poultry inspection. This bill requires antemortem inspection of birds by flock, coop, hatch, et cetera, and carcass-by-carcass postmortem inspection. It provides that all inspectors be federal employees; that the Agricultural Research Service specifically be delegated with inspection work; prohibits interstate shipment of uneviscerated carcasses; specifies sanitary requirements; defines such terms as unwholesome, inspection service, marking and labeling, official establishment, and adulteration.

Penalties for violations of provisions of the proposed measure are adequate and clear.

Official Poultry Inspection — Public-Health Viewpoint†

JOE W. ATKINSON,* D.V.M., Washington, D. C.

I would like to introduce my remarks before this panel by emphasizing that the primary concern of public health officials is to prevent or alleviate disease in man, including those diseases transmitted from animals to man. However, when a regulatory program is initiated, even though primarily because of public health considerations, the officials concerned must take into account all of the factors necessary for the conduct of an adequate program.

Dr. A. R. Miller has stated that a food inspection service must be designed not only to protect human health but to satisfy all areas of consumer protection. Thus, a poultry inspection program, in addition to protecting against the transmission of disease, should protect the consumer against all types of adulteration and misrepresentation. As Dr. C. H. Pals states with reference to meat inspection, official poultry inspection must assure the consumer that the product "came from healthy animals, that it was produced under sanitary conditions, contains no harmful preservatives, is not adulterated, has not been altered or treated to conceal inferiority and, finally, that it is truthfully and informatively labeled."

Dr. Joe W. Atkinson

Official poultry inspection is needed to remove unfit poultry from consumer channels and to insure sanitary conditions during the processing and distribution of poultry and poultry products, thereby reducing hazards of foodborne disease, minimizing health dangers to processing-plant employees, and assuring the housewife that her money spent for poultry will purchase a clean, wholesome product which meets standards of consumer expectancy.[1,2]

Over 30% of cases in foodborne outbreaks reported by the states to the Public Health

†Address given as part of a panel presentation at the Conference of Public Health Veterinarians, Atlantic City, N. J., Nov. 14, 1956.

*Public Health Service, Department of Health, Education, and Welfare.

Service, 1945-1954, were associated with poultry.[3] Reports to the Bureau of Labor Statistics during the last three years show the injury-disease rate in the poultry processing industry to be comparatively high, generally exceeded only by that of a few lumber industry operations. The standards of consumer expectancy with regard to foods are rather high in the United States, as exemplified by the Federal Food, Drug, and Cosmetic Act; and the American housewife does not want to spend any part of her food dollar for diseased poultry or for poultry which has been handled under insanitary conditions.

"Inspected and Passed" — By Whom?

The poultry processor has a responsibility to label his product in a truthful manner, so as to prevent any misleading or dishonest inference to the consumer. An official food

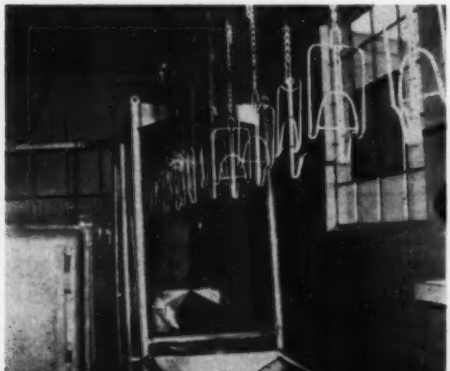

Fig. 1. Sanitary practices and suitable equipment are essential to production of wholesome poultry.

inspection agency should make sure that the processor meets this responsibility. Yet, the agency itself has an even greater obligation to make certain that any official inspection legend placed on the product is absolutely factual and will not be misleading in any respect.

Inspectors who are not employees of the official agency concerned, whether working for the processor or for some other agency, are not subject to direct administrative and technical supervision and discipline by the certifying agency. In the absence of direct and primary allegiance to the certifying agency, it is possible at times that other considerations may take precedence over public health and consumer interests. Therefore, the official inspection of poultry should be carried out by employees of the official agency represented by the inspection legend placed on the product.[4]

Official Antemortem Inspection Essential

Health officials agree that under an official poultry-inspection service, both antemortem and postmortem inspection should be mandatory.[5] Some birds may show obvious signs of illness before slaughter, but not exhibit lesions which will be recognized or properly evaluated in the few seconds ordinarily devoted to postmortem inspection. On the other hand, the appearance of the live bird may not warrant its condemnation; yet, lesions may be observed on postmortem inspection which call for condemnation of the carcass or edible visceral organs. Certainly, sick birds should be condemned, insofar as possible, prior to slaughter, so as to prevent them from contaminating processing equipment and other poultry and poultry products, and from exposing plant employees to the danger of infection.

It may be helpful to briefly outline the benefits derived from antemortem inspection of poultry. Antemortem inspection:

1. Reduces the frequency and degree of exposure of plant employees to diseases transmissible from poultry to man.

2. Minimizes contamination of equipment and utensils from diseased birds, and cross-contamination from diseased to healthy carcasses.

3. Assures more accurate evaluation and proper disposition of the poultry; (a) through condemnation of live birds which are observed to be sick, but which might not be detected through routine postmortem inspection alone, and (b), through more adequate evaluation of "suspect" carcasses on postmortem inspection.

4. Contributes to early detection of diseased poultry flocks, and the initiation of treatment, segregation, vaccination, or other disease-control measures, as well as to research and field investigations where indicated.

Postmortem Inspection

It seems that we all agree on the need for postmortem inspection of poultry. However, health officials have had considerable difficulty, at least until recently, in getting agreement from industry representatives and others that evisceration and postmortem inspection of each carcass should be required to follow immediately after slaughter and removal of the

Fig. 2. Antemortem examination of poultry.

feathers. This is absolutely essential in the light of present day food sanitation knowledge and consumer expectancy.

I believe it may be wise to review the basis for requiring postmortem inspection of each carcass. This procedure may be misunderstood by those persons not familiar with the principles involved. Briefly stated, each poultry carcass is a separate entity insofar as wholesomeness and freedom from disease is concerned, and must be evaluated separately if the inspector is to assure himself that the product resulting from passage of the carcass will be in fact wholesome and unadulterated, fit to carry the official inspection legend.

As expressed by Mr. Hermon Miller, director, Poultry Division, Agricultural Marketing Service, USDA, the official legend goes on each unit, or bird, and the theory of statistical sampling is not applicable to poultry inspection —each bird must receive whatever inspection is considered necessary. Of course, we can readily understand that, since a sampling procedure can not protect the integrity of the inspection legend, neither can it protect health and consumer interests. For such protection, each carcass with its viscera must be inspected.

Why should evisceration and postmortem inspection follow immediately after slaughter and removal of the feathers? First, to permit adequate evaluation of any lesions present before postmortem changes in consistency or appearance of tissues, organs, or disease processes can occur. Second, to allow adequate correlation of postmortem appearance with antemortem findings, and assure proper disposition of all carcasses and parts. Third, to assure completion of evisceration and preparation into ready-to-cook form without subjecting the product to the contamination which results from usual methods of holding and handling poultry carcasses in the uneviscerated (New York—dressed) form.

New York-Dressed Poultry

The contamination problem alone is reason enough for health officials to raise serious objections to current practices associated with New York-dressed poultry.[8] We should recognize, however, that these objections do not imply a criticism of those who recommended the sale of poultry in the uneviscerated form many years ago.

Much of the poultry was dry-picked in those days. It was air chilled, maintaining a dry condition on the skin. Growth of spoilage organisms was thus delayed. Hanging carcasses on racks for air chilling prevented mass cross contamination from a single diseased or carrier carcass to healthy ones during the chilling process. Poultry handled in this manner was found to remain in salable condition longer than the "eviscerated" poultry then available. This can be readily understood, because much of the latter was not completely eviscerated and ready-to-cook, but was in the form known as *drawn* poultry. Some inedible viscera and contents were usually left in the

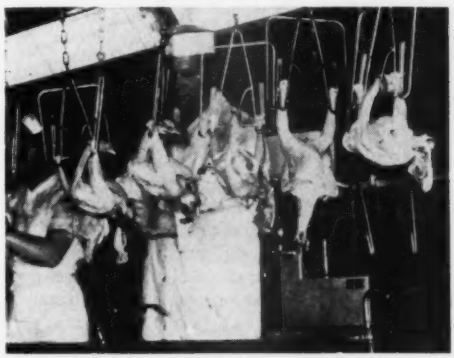

Fig. 3. USDA veterinary inspector conducting postmortem examination of carcass and viscera at a modern processing plant.

carcasses. Incised tissues and body cavities were not thoroughly washed free of filth and contaminants, if indeed they were washed at all. Under such conditions, the housewife herself knew it was better to buy the New York-dressed bird rather than one which had been so grossly contaminated by the drawing process.

Those considerations do not apply today. The industry has shown that it is both possible and commercially practicable to eviscerate poultry in a sanitary manner and prepare it in a ready-to-cook form which has good keeping quality and which appeals to the shopper. Furthermore, present methods of handling New

York-dressed poultry compare unfavorably with those of former times. Now, the unevisceratedcarcasses are usually chilled in ice slush, cracked ice, or water. They may even be frozen and defrosted later in tanks of water. The epidermis is often removed as a result of high temperature scalding, eliminating this natural barrier to bacterial growth and penetration.

These practices result in mass contamination of the birds with intestinal contents leaking from the vents and with other wastes, including those from diseased birds and from carriers of organisms dangerous to man such as the Salmonella. This contamination occurs not just on the external surfaces but also permeates the feather follicles, and underlying tissues at points of incision or damage to the skin. It may pass by way of the trachea into the lungs, and even into the air sacs which are located in those parts of the carcass passed for food. Water up to 4-7% of the weight of the carcass is absorbed during a 2-4 hour period of chilling in ice slush or water contaminated by such wastes.

This is not a pretty picture. It certainly is not one to be recommended or condoned by public officials. Aside from hazards to human health, human sensibilities are insulted. *Such practices are contrary in every way to present-day concepts of sanitation in food processing and preparation.*

They are even more reprehensible when, as is often the case, the New York-dressed carcass is finally eviscerated and processed into an unrecognizable form such as soup or pie, or served in a restaurant, or sold as a fresh ready-to-cook product to the unsuspecting consumer, who has every reason to believe that the poultry carcass from which his purchase was derived was slaughtered, promptly eviscerated, and handled in a clean manner at all times.

In the future, official poultry inspection services should specifically require evisceration and postmortem inspection of each carcass immediately following slaughter and removal of the feathers.

Federal, State, and Local Action Required

Both a mandatory, federal poultry inspection program and effective state and local poultry inspection services are needed. With regard to interstate commerce, the administrative difficulties involved in one state or local agency assuring itself of the adequacy of inspection and sanitary controls provided by agencies in other states would be a burden for some years

Fig. 4. Condemnation of diseased carcasses by veterinary inspector of U. S. Department of Agriculture.

to come. Therefore, the states have pointed to the example afforded by the federal meat inspection service, and have recommended[7] that the federal government establish a "Requirement that all dressed poultry shipped interstate be inspected for wholesomeness before and after slaughter," and a "Requirement that all dressed poultry shipped interstate be eviscerated."

A substantial quantity of poultry, however, is processed in plants which ship their products only intrastate. Obviously, it is important to provide effective, official inspection services, either state or local, in these plants. This is necessary, not only to provide protection of health and consumer interests in connection with the poultry normally processed in such plants at the present time, but also because such plants might well become a "dumping ground" for diseased, unfit poultry in the presence of an effective, federal poultry-inspection program and the concurrent absence of such a program at state and local levels.

Therefore, the states have requested guidance from the Public Health Service in the form of a suggested ordinance, and technical assistance in the development and maintenance of effective poultry inspection and sanitation programs at state and local levels.[5,6] The Service published suggested poultry sanitation requirements in April 1955, and a comprehensive suggested poultry inspection and sanitation ordinance is now nearing completion.

Inspection and Research Both Needed

Poultry inspection alone will not solve all the health problems associated with poultry. Even with inspection, there will be some food-borne outbreaks caused by contamination and lack of proper cooking or refrigeration of poul-

try dishes in home kitchens and commercial eating establishments. Undoubtedly, there will continue to be some incidence of illness among poultry processing employees.

Nevertheless, mandatory official inspection of poultry is an essential first measure. It will effectively reduce the likelihood of foodborne disease outbreaks caused by diseased poultry or as a result of contamination during processing. It will aid in controlling the injury disease rate in poultry-processing plants. It will assure the consumer of wholesome, acceptable poultry and poultry products. Furthermore, it will form a background and supporting framework for the public health research and field investigations so urgently needed in connection with sanitary control measures in the poultry processing and distributing industry, and in the entire field of diseases affecting both poultry and man.[8] (To mention one example, we must learn more about the epidemiology of psittacosis in poultry and its transmission to man before attempts at control will be completely successful.)

As a supplementary benefit, mandatory poultry inspection programs will contribute to the detection, investigation, and prevention or eradication of those diseases of poultry which are not a health hazard to man, but which are costly to the entire poultry industry and, as a result, to the purchasers of poultry and poultry products. ("The economic loss due to poultry health problems cost the American farmers about $300,000,000. annually . . ."[9])

Cost of Inspection

Some health officials have expressed concern over the cost of adequate poultry inspection services. In comparison to the financing of other health services considered to be of equal or greater importance, the funds required for poultry inspection may seem unduly large. Yet, we must not forget that the cost for inspection, aside from the health protection provided, is actually a cost that is necessary in order to produce a food which meets the other areas of consumer protection and expectancy, *i.e.* a necessary production cost. Furthermore, official inspection of all poultry would provide health and consumer protection to practically all citizens, infants as well as the aged, not just to a select class or age group.

Thus, when compared to the benefits which will result, the cost of official poultry inspection becomes almost insignificant. In testimony before the Subcommittee on Legislation Affecting the Food and Drug Administration of the Senate Committee on Labor and Public Welfare, 84th Congress, Second Session, Mr. Earl L. Butz, assistant secretary of agriculture, estimated that the total cost of the present USDA voluntary poultry-inspection program would be just slightly over $2,500,000. during fiscal year 1956.

Approximately 25% of poultry sold off farms was inspected postmortem during 1956. Allowing a reasonable, smaller amount to provide for antemortem inspection, and considering that processing plants of smaller size and output would be brought under inspection, it may be assumed that mandatory federal inspection of poultry, both antemortem and postmortem, might be provided in all plants engaged in interstate commerce at a cost about four times the figure quoted by Mr. Butz, or $10,000,000. However, even if it should cost as much as $15,000,000., it would still amount to less than $0.10 per person per year.

Considering that the average per capita consumption of poultry is almost 30 lb. ready-to-cook weight, and that much of this is consumed in soups, pies, salads and other forms which allow numerous servings from each pound, it is no wonder that housewives across the country not only raise no objection to the cost for mandatory official poultry inspection, but generally assume that such inspection is already being provided. Those who have learned otherwise are demanding it!

Summary

Official inspection of poultry is necessary to reduce hazards of foodborne disease, to minimize the injury disease rate in poultry processing plants, and to assure the American housewife of a clean, wholesome product which meets standards of consumer expectancy. To prevent misrepresentation and to assure protection of health and consumer interests, poultry inspectors should be employees of the official agency represented by the inspection legend placed on the product. Official antemortem inspection of poultry should be mandatory, and evisceration and postmortem inspection of each poultry carcass should follow immediately after slaughter and removal of the feathers. A mandatory federal poultry inspection program and effective state and local poultry inspection services are needed. Public health research and field investigations on the factors involved in transmission of disease from poultry, and through poultry and poultry products, to man are needed. Official poultry-inspection services are basically essential to the protection and advancement of health, consumer, and producer

interests. Even at the highest reasonable estimate, the cost of a mandatory federal poultry inspection service would be less than 10 cents per person per year.

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Need for Eradication of Swine Diseases

A program that is intended to eradicate vesicular exanthema and hog cholera is being given serious consideration by regulatory officials as indicated during a conference on these ailments. The consensus is that for the eradication of vesicular exanthema — in fact for all swine diseases—the extension and strict enforcement of garbage-cooking laws are necessary. It is indicated that 10% of commercial garbage fed hogs are now fed raw garbage. For the eradication of cholera the advanced step already taken by several states prohibiting the use of live virus for vaccination must be made general, which will require more legislative action. It was emphasized at this conference that several foreign countries have embargoes against American pork because of fear that viruses of cholera and vesicular exanthema in carcasses or products are potentially sources of danger to their animals.

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A project to classify tuberculosis organisms of known reactor cattle may reveal that other than the bovine type of the tubercle bacillus is responsible for the disease in cattle.

Lymphocytic Choriomeningitis in Cattle

(Continued from page 168)

The evidence in the case histories suggests that skunks may have been instrumental in transmitting the disease. Several skunks have been injected with the virus, but none have developed symptoms to date. The absence of lymphocytic choriomeningitis in the first experiments with skunks may have been caused by the route of injections used. Intramuscular injections (adductor muscle) in both skunks and raccoons failed to produce the disease. Later the use of the sole pad route instead of muscular one produced the disease in a raccoon. Tests of a similar nature on skunks are being conducted.

Conclusions

Three cattle, submitted for rabies diagnosis, were found to be negative by microscopical and mouse injection tests. The inoculation of mice and guinea pigs with fluid from the ventricles of cattle produced symptoms indicative of lymphocytic choriomeningitis. Skunks may have been the vectors in the transmission of the disease to cattle. A raccoon injected with the brain and spleen of the mice developed similar symptoms in 24 days. Studies are continuing on raccoons and skunks injected with brain material from the original cattle involved.

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Local Effects Of Various Concentrations Of Hexylcaine Hydrochloride And Procaine Hydrochloride On The Pudendal Nerve And The Infraspinatus Muscle

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THE ideal local anesthetic must possess certain desirable characteristics. These characteristics, according to Goodman and Gilman[5] and Jones,[4] are the ability to produce anesthesia without damaging nerve structure, be readily soluble in water, stable in solution, have low systemic toxicity, and produce anesthesia of a duration sufficient for the contemplated surgical procedure. The effort to find an anesthetic agent which fulfills all of these requirements has led to the introduction of many compounds for local anesthesia. One of these compounds is hexylcaine hydrochloride (Cyclaine®[1]).

Hexylcaine hydrochloride has received extensive trials in man. It has been reported to produce anesthesia more rapid in onset[1] and of longer duration[1,8] than procaine hydrochloride.

Hexylcaine hydrochloride has been used in cattle as a local anesthetic agent. Roberts[9] compared the duration of epidural anesthesia in cattle produced by procaine hydrochloride, pontocaine, cobefrin®[2], and hexylcaine hydrochloride and reported that the anesthesia produced by hexylcaine hydrochloride was of longer duration than that produced by the other compounds. McAuliff, Phillips, and Steele,[7] and Wheat[10] reported anesthesia of long duration with little motor paralysis when hexylcaine hydrochloride is used in epidural anesthesia. Wheat[10] comments on the rapidity of anesthesia after injection in cattle. When used in paravertebral anesthesia, he reported that there was less lateral curvature of the spine than with procaine hydrochloride.

Wheat[10] and McAuliff *et al.*[7] reported that hexylcaine hydrochloride produces rapid anesthesia of long duration when used for local infiltration in cattle. Bullard[2] reported that in cattle it gave prompt anesthesia when used for local infiltration.

Experimental Procedures

No reports have been found in the literature regarding the local effects of hexylcaine hydrochloride on nerves and other tissues of cattle. Thus it was decided to investigate the duration of anesthesia produced by blocking a nerve, the effect on the nerve, and the effect on tissues surrounding the nerve by various concentrations of hexylcaine hydrochloride as compared to various concentrations of procaine hydrochloride.

Methods

Twelve animals were used in this experiment. They consisted of two female and ten male calves weighing from 125 to 215 lb.

The pudendal nerve, at a site just deep to the sacrotuberous ligament, was selected as the test nerve for determining the effect of the agents upon the nerve and the tissues surrounding it. This selection was based principally on the fact that when the Larson pudendal nerve

From the divisions of Veterinary Surgery and Radiology (Arnold), Veterinary Pathology and Parasitology (Sautter), Veterinary Anatomy (Kitchell), and Veterinary Obstetrics (Larson).

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Based on a thesis submitted by the senior author to the Graduate School of the University of Minnesota, in partial fulfillment of the requirements for the Ph.D. degree.

®[1]Merck,, Sharpe and Dohme, Inc., Philadelphia, Pa.

®[2]Cook Waite Lab., Inc. (procaine hydrochloride pontocaine 0.0015% and cobefrin 1:10,000).

block technic[6] is used, the nerve itself is palpated to insure that the anesthetic solution is deposited around it. Another advantage of this nerve is that, in the area where the injection is made, the nerve is surrounded by soft tissue thus reducing the possibility of pressure damage. Also, the pudendal nerve supplies an area of skin which is readily available for testing the onset and duration of anesthesia.

The infraspinatus muscle, at a point just posterior to the acromion process of the scapula, was selected as the site for determining the effects of the various concentrations of the anesthetic agents on muscle. The paravertebral muscles, the site selected by Margolis, Hall, and Norwill,[8] could not be used in this experiment as the calves had been used in a previous experiment in which these muscles had been incised.

Procaine hydrochloride was chosen for comparison with hexylcaine hydrochloride because of its known low toxicity both locally and systemically. In cattle, procaine hydrochloride is commonly used in concentrations ranging from 2 to 4%. Hexylcaine hydrochloride is available commercially in 1 and 5% solutions. The dosage used was standardized at 10 ml. for each pudendal nerve and in each infraspinatus muscle.

The pudendal nerve on one side was injected with a given concentration of procaine hydrochloride solution and the time noted when the injection was completed. Then the same concentration of hexylcaine hydrochloride was injected on the opposite side and the time noted. The procaine hydrochloride was injected first as the hexylcaine hydrochloride tended to anesthetize the nerve in less time. The extent of anesthesia was tested by needle pricks and the time of onset and disappearance of anesthesia recorded. The same concentration of anesthetic solution used on each side was injected into the infraspinatus muscle on that side. Seven or eight days later the animal was destroyed, gross changes noted, and specimens collected. The pudendal nerve in the area injected was removed and stretched on a piece of cardboard. The specimens were fixed in 10% formalin solution. The sections were cut 8 micro. thick and stained. Some were stained using the Holmes axis-cylinder staining technic while others were stained with hematoxylin-eosin. The infraspinatus muscle in the area injected was removed, examined for gross changes and fixed in 10% formalin solution. The sections were stained with hematoxylin-eosin.

Results and Discussion

It appeared from the small number of trials reported here (table 1) that there was an individual variation in the duration of anesthesia produced by blocking the pudendal nerve in calves. This variation agrees with the reports by Roberts[9] that epidural anesthesia produced by 5% solution of hexylcaine hydrochloride lasted from 5.5 to 12 hours. McAuliff *et al.*[7] and Wheat[10] also report the more prolonged anesthesia with hexylcaine hydrochloride than with procaine hydrochloride.

At autopsy, seven or eight days after injection, no gross changes were noted in any of the pudendal nerves blocked with procaine hydrochloride (table 1). The 1% solution did not produce gross changes around the pudendal nerve but the 2% solution produced some edema in the tissue around the nerve of one calf. This was not extensive. There were no gross changes around the nerves blocked with 3% solution of procaine hydrochloride but the nerve was larger than normal. The 4% solution of hexylcaine hydrochloride produced a gelatinous appearance in the tissues surrounding the nerve. This tissue could not be separated from the nerve without damaging it. The tissues around one of the nerves blocked with 5 per cent hexylcaine hydrochloride also had a gelatinous appearance. Fat adhered to all three of the pudendal nerves blocked with 5% solution of hexylcaine hydrochloride.

On microscopic examination nine of the 23 nerves blocked by the various concentrations of hexylcaine hydrochloride or procaine hydrochloride revealed evidence of hemorrhage around the nerve (table 1). This was indicated by the presence of hemolyzed red blood cells and fibrin. Macrophages were present in some of the sections. Three of the nerves with hemorrhage had been blocked with procaine hydrochloride, while the remaining six had been blocked with hexylcaine hydrochloride. The hemorrhage was believed due to trauma by the needle used to deposit the anesthetic solution around the nerves. The greater prevalence of hemorrhage on the side injected with hexylcaine hydrochloride solution may be explained by the fact that it was injected after the procaine hydrochloride had been injected on the opposite side. Some animals became apprehensive after the first injection and tended to move when the second injection was made.

The microscopic changes in the tissues around the nerve, other than evidence of hem-

orrhage, consisted of an increase in fibroblasts and connective tissue fibers with the greater concentrations of hexylcaine hydrochloride (table 1). This was found in the tissues around one of the nerves blocked with 4% solution of hexylcaine hydrochloride and around all three nerves blocked with 5% hexylcaine hydrochloride. The connective tissue formation was not extensive but there was a definite increase in the number of fibroblasts and connective tissue fibers. Two of the nerves blocked with 5% hexylcaine hydrochloride had more macrophages in the tissues around them than the other pudendal nerves. One of these nerves had evidence of hemorrhage around it while the others did not.

The 1 and 2% solutions of both hexylcaine and procaine did not produce any microscopic changes between the fasciculi of the pudendal nerve trunk (table 1). Procaine hydrochloride in concentrations of 3% and above produced a small amount of edema between the fasciculi of the nerve trunk with the exception of two of the nerves blocked with 5% concentration

TABLE 1. Hexylcaine and Procaine Hydrochloride Studies: Duration of Anesthesia and Effect on the Bovine Pudendal Nerve

Animal No.	Anesthetic used	Side injected	Duration of anesthesia Hr. Min.	Gross Changes	Microscopic Changes: Changes outside of epineurium	Changes outside of fasciculi	Changes outside of nerve fibers	Changes in nerve fibers
133A	1% Pr.*	R(1)	0:35	None	None	None	None	None
	1% Cy.**	L(2)	0:35	None	None	None	None	None
149A	1% Pr.	R	0:23	None	None	None	None	None
	1% Cy.	L	0:38	None	Slight hemorrhage (old)	None	None	None
162A	1% Pr.	L	1:16	None	Slight hemorrhage (old)	None	None	None
	1% Cy.	R	3:19	None	Slight hemorrhage in fat (old)	None	None	None
136A	2% Pr.	L	1:54	None	Slight hemorrhage in fat (old), macrophages	None	None	None
	2% Cy.	R	2:34	Edema in fat around nerve	None	None	None	None
151A	2% Pr.	R	1:04	None	None	None	None	None
	2% Cy.	L	3:34	None	None	Slight edema	None	None
155A	3% Pr.	R	1:50	None	None	Edema	None	None
	3% Cy.	L	3:45	Nerve slightly enlarged	None	Slight edema	None	None
156A	3% Pr.	R	2:22	None	None	Edema	None	None
	3% Cy.	L	3:42	Nerve slightly enlarged	None	Slight edema	None	None
157A	4% Pr.	R	3:39	None	Hemorrhage (old), macrophages	Edema	None	None
	4% Pr.	L	3:39	Gelatinous appearance around nerve, nerve enlarged				
163A	4% Pr.	L	3:54	None	Slight hemorrhage (old), macrophages and eosinophiles present	Some edema near edge of nerve trunk	None	None
	4% Cy.	R	6:23	Gelatinous appearance around enlarged nerve	Hemorrhage (old), some connective tissue formation	Edema	None	None
159A	5% Pr.	R	2:34	None	None	Slight edema	None	None
	5% Cy.	L	6:21	Gelatinous appearance, fat around nerve adhered to it	Some connective tissue formation	Edema, eosinophiles around blood vessels	None	None
160A	5% Pr.	L	2:45	None	A few macrophages	None	None	None
	5% Cy.	R	6:35	Fat around nerve adhered to it	Hemorrhage (old), macrophages, some connective tissue formation, macrophages	None	None	None
166A	5% Cy.	L	9:15	Fat around nerve adhered, nerve enlarged	Some connective tissue formation, macrophages	Slight edema	None	None

* — procaine hydrochloride. ** — hexylcaine hydrochloride (Cyclaine). (1) — right. (2) — left.

which showed no edema. One of the nerves blocked with 4% concentration showed edema only between the fasciculi near the periphery of the nerve trunk. The 3 and 4% concentrations of hexylcaine hydrochloride produced edema between the fasciculi which was more extensive than that produced by the solutions of procaine hydrochloride. One of the nerves blocked with 5% solution of hexylcaine hydrochloride showed no edema between the fasciculi, one had slight edema, while the other nerve had more extensive edema and a large number of eosinophiles around the blood vessel within the nerve trunk.

At autopsy no gross changes which would have represented tissue damage were noted in any of the muscles injected with one of the various anesthetic solutions. The attempt to obtain sections of the area of muscle injected failed because the part could not be accurately identified at the time of autopsy. The muscle shifted its position according to the amount of the weight borne by the limb. It also moved when the muscle fibers were cut. Thus no suitable sections were obtained for microscopic study.

Summary

The use of procaine hydrochloride in 1 and 2% concentrations did not produce gross or microscopic changes in the pudendal nerves of calves or in the tissues surrounding it. The use of higher concentrations (3%, 4%, and 5%) showed a slight tendency to produce edema between the fasciculi within the nerve trunk. This edema did not extend to the structures within the fasciculi. The various concentrations of procaine hydrochloride produced no gross changes in the infraspinatus muscle. Perineural injection of procaine hydrochloride in concentrations from 1 to 5% in amounts up to 10 ml. was not associated with changes in the nerve or the surrounding tissues of calves.

The 1 and 2% solutions of hexylcaine hydrochloride appear to be a safe agent for local infiltration in calves. The 3% solution of hexylcaine hydrochloride could be used for local infiltration but is less desirable than the lower concentrations. The higher concentrations (4% and 5%) would appear not to be desirable for local infiltration, but may be used for nerve blocking as there was no evidence of damage to individual nerve fibers.

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Influenza Vaccine Trials

Some limited trials with influenza are in progress but little of that now available is being used according to report of the U. S. Public Health Service.

Physicians have yet to be convinced of effectiveness of vaccines so far perfected. The public, too, is apathetic because of the less severe illness now caused by the virus that formerly proved virulent and may again cause serious outbreaks. A number of research organization have assigned top scientists to the project and are devoting vast facilities for intensive study from which improved products may be expected.

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Bluetongue in Sheep

Special government report indicates that 25 flocks of sheep in 59 counties of ten states and representing 209,490 sheep have experienced bluetongue during 1956. Morbidity ranged from 3 to 33% and mortality from 1 to 15%. Except in one state (Utah) estimated death losses ranged near 1 to 5%.

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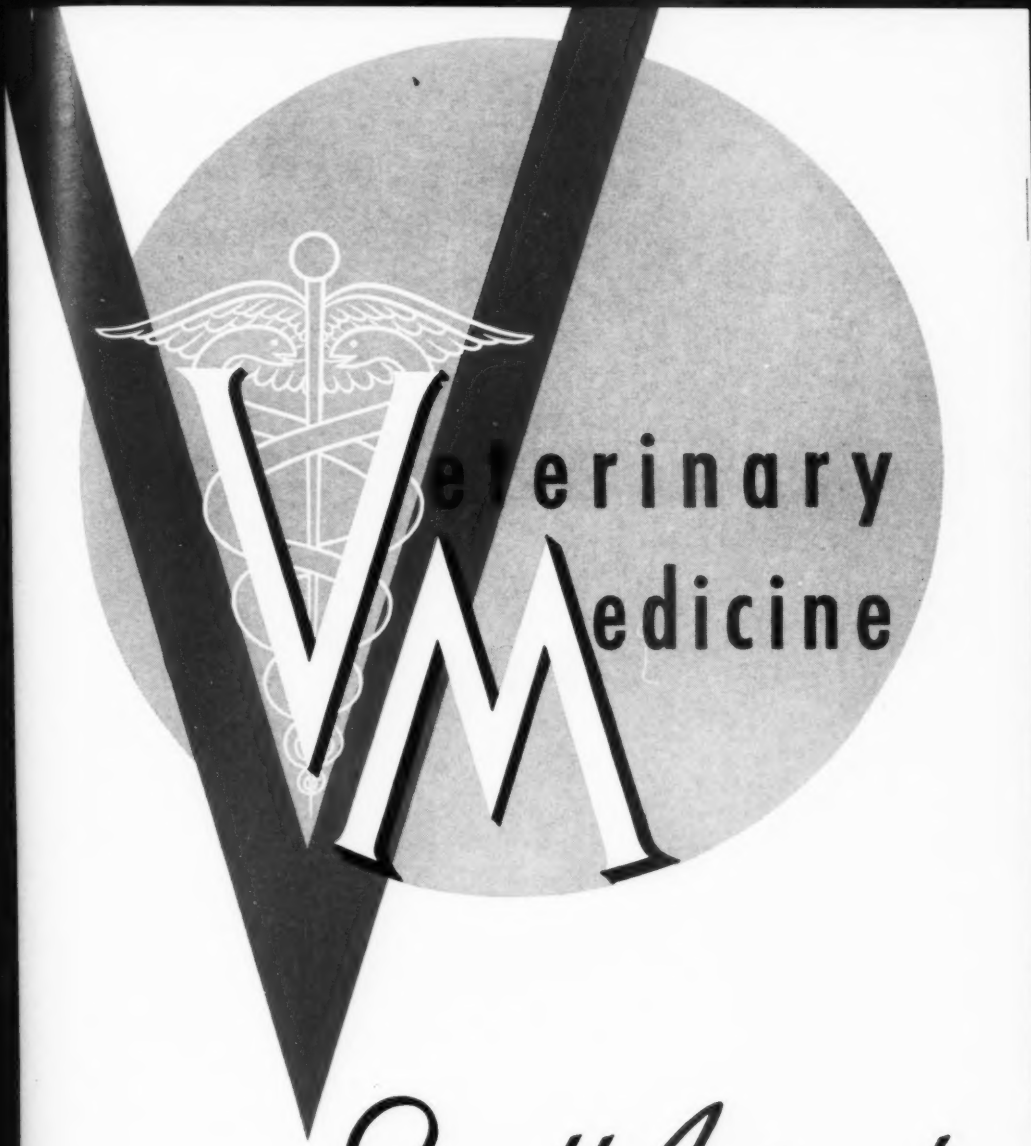
Proposed regulations in California would provide that on petition to the State Department of Agriculture of 75% or more of cattle owners, representing a majority of the cattle in a county, the area may be declared brucellosis control area.



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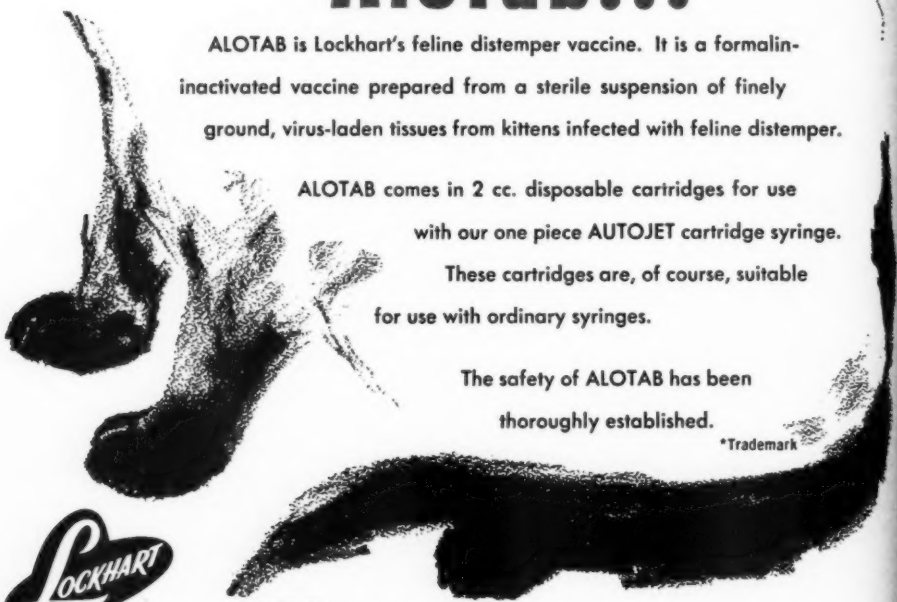

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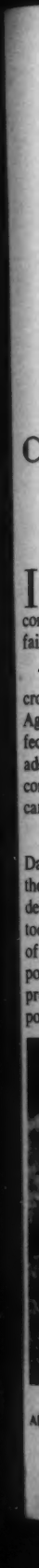

Correction Of Faulty Ear Carriage In The Dog

W. F. IRWIN, D.V.M., Tulsa, Oklahoma

IN those breeds in which it is the custom to do ear cropping, it is not an uncommon complication to have either one or both ears fail to stand correctly.

The cause of faulty ear carriage following cropping can be due to a number of factors. Age when cropped, poor surgical technic, infection, improper after-care, illness, and inadequate diet are a few of the complicating considerations that might explain improper ear carriage.

In breeds having ears such as the Great Dane, Doberman Pincher, and Boxer, one of the most common causes of faulty carriage is delay of surgery, allowing the puppy to become too old before cropping. Muscles and cartilage of the ear develop in their natural hanging position and it is difficult to get ears to stand properly due to tendency to assume the natural position along side of the head. Ridges, folds and breaks in the cartilage will be much less developed in the eight- to ten-weeks-old puppy than in the three or four-months-old individual. The ears of the young dog lend themselves much better to repositioning in the unnatural position above the head than will those of the older animal. Thick, heavy, and short-eared individuals are not as good risks for ear cropping as is the long, thin eared one.

Faulty surgical technic can be blamed for failure of the ears to stand in many cases. Removal of too much skin from the posterior surface of the ear will cause excessive tension to be exerted on the suture line when edges are brought into apposition, resulting in malposition. The infected ear always heals slowly and is prone to develop thick scars and adhesions along the cut edge causing the cartilage to buckle, thus to pull the tip downward. Placing continuous sutures too tight has a tendency to pucker edges and tip the ear outwardly.

Fig. 1. Brindle Boxer, male, four months of age (l.). After cartilage implantation (r.) 30 days later.

Fig. 2. Surgical intervention to undermine area in preparation to placing graft along cut edge on posterior ear surface.

Poor after-care is probably the most common factor resulting in failure of ears to stand. If not properly protected they become infected, swelling occurs causing the sutures to pull out, leaving a large gaping incision line that is slow to heal. When healing does occur in the infected incision, extensive scar usually shrinks and pulls the ear out of position.

The use of some kind of device to give support to the ear during the healing period is a debatable question among surgeons. In support of their use is the argument that they do keep the cut edge straight and under slight tension, which discourages formation of adhesions and buckling of cartilage.

Other factors such as faulty diet, illness, and parasitism certainly contribute to poor results in ear cropping.

Many methods of correcting faulty ear carriage following cropping have been described and practiced. Most of these have depended on the production of scar tissue in the cartilage to cause rigidity and an improvement in the upright position of the ear. Scar tissue may be produced by surgery, use of cautery, or the injection of irritants. Another method has been the use of foreign materials such as whale-bone bougies, plastics, and steel wire implanted into ear tissues to add support and stiffness. The removal of, or reposition of sections of skin or muscles has proven to be effective in some cases.

Because of the great variation in end results from the before mentioned methods of repair, the idea of using a homogenous cartilage graft was conceived and tried on an experimental basis on several cases.[1] Results have been uni-

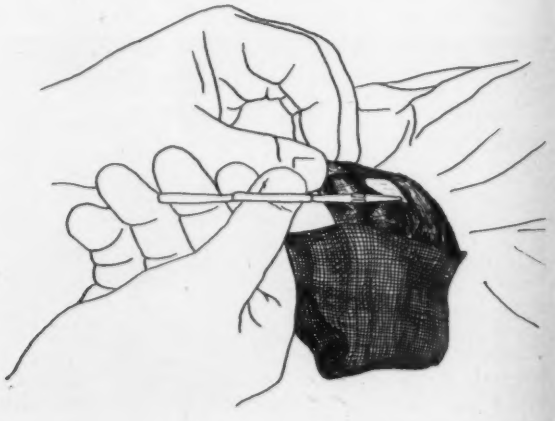

Fig. 3 Illustrating technic for positioning graft.

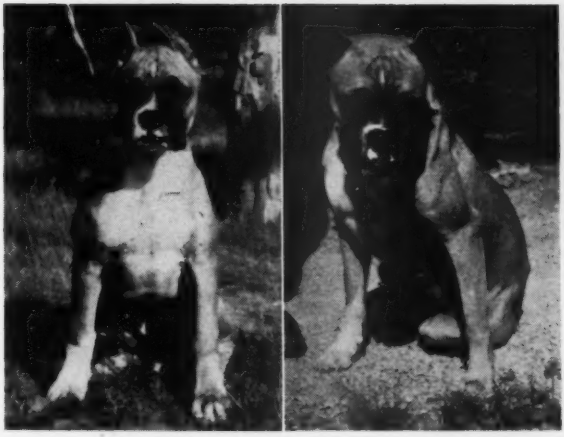

Fig. 4. Faun Boxer, female, four months of age (l.) illustrating two types of faulty carriage. After surgery (r.).

formly good, and the method has become routine practice at our hospital.

Cartilage Bank

Cartilage from donor dogs is used. The waste cartilage left from ear cropping may be used, but experience has proved that the firmer cartilage from mature animals gives best results. Cartilage may be harvested in considerable quantity from a sacrificed donor, or fresh cadaver and placed in a cartilage bank.

The procedure for collecting and banking cartilage material is outlined as follows:

Mature dogs are selected as donors. Breeds such as Shepherds, and others with natural upright ears have been satisfactory. Under general anesthesia the ears of the donor are prepared for aseptic surgery. The dog is destroyed and the ears removed close to the head with heavy scissors or knife. The skin from both sides of the ear is removed by first incising around the edge of the ear and then pulling the skin away from the cartilage. Aseptic surgical technic is observed throughout the procedure. After the skin has been removed from both sides of the cartilage, any fascia or muscle tissue is dissected away to leave a clean sheet of cartilage material. The perichondrium may or may not be removed. There has been no evidence in our work that the presence or absence of the perichondrial membrane alters survival period of the graft.

The sheet of cartilage is cut into strips three-eighths of one inch wide and about one and one-half inches long, then dropped into a previously sterilized jar containing about 30 cc. sterile saline solution, 500,000 units of crystaline penicillin and 1 gram of dihydrostreptomycin. The jar is sealed after determining that all of the cartilage strips are immersed in the solution, and then placed in a refrigerator at 37 C. for 24 hours. At the end of the 24 hour period strips of cartilage are removed and placed in individual sterilized vials or small jars, sealed, dated and stored in a deep freeze until needed.

We are not certain of the true behavior of these homogenous ear cartilage grafts at this writing. Barsich and Riddell[2] state that fresh homogenous cartilage grafts resist absorption and cells remain viable because the tissues are avascular and their gel-like matrix is rich in nucleoprotein, which serves to protect the cells from hostile host antibodies.

Peer[3] in his work on Transplantation of Tissue, expresses the opinion, that in general, one can state that no investigator has demonstrated that the cells in living homogenous transplants survive for long periods excepting possibly cartilage cells, the cells of connective tissue, part of the cornea, the lens, and certain red blood cells in transfusion.

A cartilage graft in contact with cartilage, or any other host tissue heals by fibrous tissue union rather than by cartilaginous union, and new formation of cartilage has not been observed in human cartilage grafts regardless of the presence or absence of perichondrium, or the youth of the graft and that of the recipient.[4]

Cartilage grafts apparently retain their normal mechanism of nutrition by osmotic diffusion of tissue fluids from the host bed into the graft rather than the method of penetrating capillary ingrowths.

This work in dogs has not been under observation for a sufficient period to render an opinion on the survival period of these frozen homogenous grafts. In one dog, a Staffordshire

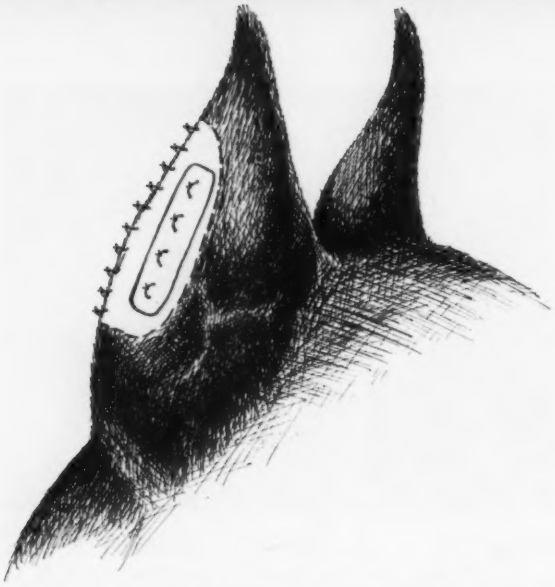

Fig. 5. Diagramatic outline of graft position between cartilage and skin of posterior ear surface. Drawing exaggerates to illustrate relations rather than to present correct proportions.

Terrier, killed in an automobile accident two years after transplant, the graft appeared to be in its original state, but firmly attached by fibrous union to the surrounding tissues. The same was observed in a Doberman Pincher autopsied three years after surgery.

Sterile, frozen homogenous cartilage grafts are well tolerated, there being little if any reaction in surrounding host tissues.

Age and breed are important factors to be taken into consideration when attempting to correct faulty ear carriage with homogenous cartilage grafts. The ideal age in all breeds would appear to be between four and six months; however, in Boxers the results have been quite satisfactory up to one year of age. In Dobermans and Danes, the procedure has not been sufficiently successful in dogs over eight months of age to justify its use.

Location of the Graft Site

The selection of the site on the ear for location of the graft will depend somewhat on the nature of the weakness that is causing the failure of the ear to stand. Two sites are used. A posterior graft placed beneath the loose skin on the back of the ear and close to the trimmed edge, and an anterior graft,[5] which is placed beneath the loose fold of skin inside and on the anterior or leading edge of the ear.

If the fault appears to be due to weakness of the cartilage along the trimmed edge, or a break across the cartilage, the posterior graft would be the one of choice. If the weakness appears to be in the leading edge, the anterior graft should be selected. In those cases where the ear is heavy and has little rigidity, both

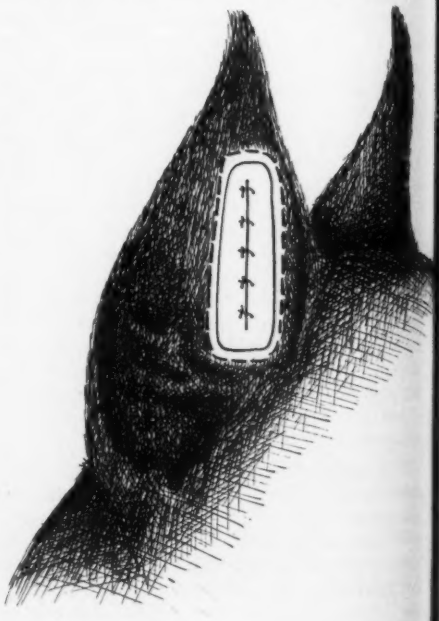

Fig. 6. Illustrating location for anterior graft, undermined area between cartilage and skin on inner surface of the ear, and approach by the leading margin, and suture positioning. Graft is exaggerated also in this drawing.

Fig. 7. Left ear of this Boxer pup appeared to be completely broken to position (l.). Same animal (r.) 30 days later, illustrating desirable ear carriage.

sites may be used. In our experience, the ears that fall over the top of the head, will respond to the posterior graft alone.

Surgical Procedure

Aseptic surgical technic must be strictly adhered to throughout operative procedure. Infection introduced into the graft bed, or a contaminated graft, will lead to abscess formation and sloughing, necessitating later drainage and removal of the graft material, thus defeating the purpose of the operation.

General anesthesia is employed. The standard procedure of close clipping, cleaning, application of presurgical antiseptics, and sterile draping of the patient is practiced.

Posterior Graft

A three-fourths inch long incision is made in the old original cropping scar on the edge of the ear at least one-half inch above the break or area of weakness in the ear cartilage. A closed pair of six-inch hemostats are introduced into the incision and forced downward between the skin and cartilage for a distance of one and one-half inches. The jaws of the hemostats are forced open thus separating the subcutaneous tissues between the cartilage of the ear and the skin on the back of the ear. In this manner a bed is prepared to receive the cartilage graft in a limited amount of time, and with a minimum of hemorrhage.

The cartilage graft is removed from its sterile container and shaped to the desired size. It is then inserted through the incision and into the subcutaneous bed by aid of thumb forceps. Care should be taken to insure that the graft is of proper size and shape to fit in the bed without wrinkling or folding.

The graft is secured in position by through-and-through mattress sutures. Care must be taken that sutures pierce the graft to assure that it does not slide out of position. Four mattress sutures are usually sufficient to anchor the graft in place, and bring the separated tissues back into apposition. It is desirable to place one of the mattress sutures across the break or weak area of the ear cartilage. Removal of the sutures will be much easier if they are tied on the inside of the ear.

Suture material should be of a non-absorbable, non-capillary nature. Steel wire gives good results. Removal of this type is painful. The imported, non absorbable suture material obtainable under the trade-name vetafil®[1] (Bengen), in size medium, has given excellent results in this type of surgery.

The incision on the edge of the ear is closed with interrupted sutures, placed one-fourth inch apart.

Anterior Graft

A three-fourths inch incision, perpendicular in plane, is made through the loose skin on the inside of the ear near the anterior border, and close to the base of the conchal cartilage. With the aid of hemostats the skin is undermined for a distance of one-fourth inch in all directions from the edges and ends of the incision. The graft is shaped to fit beneath the skin in the undermined area. The incision is closed with interrupted sutures. Because of the minimum of hemorrhage in this area, and the firm attachment of skin to underlying structures, it is not necessary to use mattress sutures to secure this graft.

Support Following Surgery

For optimum results, it is best to support the ear in the desired upright position for a ten

®[1]Dr. D. Jackson, Washington, D. C.

day healing period. A comfortable, light weight and protective cast can be made with sterile gauze and duo surgical adhesive.®[3] Immediately following surgery, and while the dog is still under anesthesia, the entire ear from tip to base, inside and out, is coated with the liquid adhesive. Two thicknesses of sterile gauze are applied to the ear and shaped into a cast. A second thin coat of the liquid adhesive is applied over the outside of the cast. The use of a hand hair dryer will greatly facilitate drying and shaping of the cast.

After Care

Penicillin is administered for three days following surgery. The owner is instructed to confine the dog and observe closely for attempts at mutilation of the cast or casts. Casts are removed when they loosen from the skin, which is usually from ten to 14 days.

Mattress sutures appear to aid in adding support to the ear, and it is good practice to leave these in place for an additional five days. If the case was a favorable subject for correction by grafting, no further treatment should be necessary.

NOTE: *The author wishes to give recognition and credit to Dr. R. L. Butler, Small Animal Practitioner, Topeka, Kansas, for the original idea and suggestion that homologous cartilage grafts might be of aid in correcting faulty ear carriage in dogs whose ears failed to stand correctly following cropping. Doctor Butler offered the suggestion to the author at the Arizona State Veterinary Medical Association meeting, Chandler, Ariz., December 7, 1952. Drawings by George Standingbear, Tulsa, Okla.*

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Poor management, malnutrition, and parasitism stand foremost as contributing factors to the maladies affecting the estimated 22,500,000 dogs in the United States today.

®[3]Johnson and Johnson, New Brunswick, N. J.

"Leaflets Three — Let it Be"

Poison ivy, one of the biggest plant nuisances to millions of individuals in the United States, may be losing its sting.

The plant is making its seasonal debut in most parts of the nation and, from now until the first frost, millions of persons probably will be afflicted with a temporary siege of itching, blistering and maybe a bit of bitterness toward mother nature.

But, some of the newer products on the market today, resulting from years of research, contain ingredients which not only neutralize itching and blistering on affected skin areas but also serve as a preventive.

Parke, Davis & Company recently introduced a lotion (ziradryl)® designed not only to cut down the after effects of exposure but possibly to eliminate the after effects altogether, if applied before contact.

Poison ivy, from six inches to three feet in height, is from the same plant family as the more likeable cashew and pistachio nut trees. The best known forms are the bush and the woody climbing vine growing up the sides of trees, fence posts and telephone poles.

Leaves of the ivy are its best identifying mark. Each leaf consists of three leaflets, the center leaflet having a long stalk and the others very short stalks. The leaf is dark green and shining, but the entire plant is poisonous, not just the leaves.

Urushiol, the toxic principle of poison ivy, is what causes the trouble for those susceptible. Upon contact, it gains entrance to the skin, and its chemical (dihydroxybenzene) nucleus causes the irritant action.

Although there are approximately 75 products on the market for treatment of ivy poisoning, only about five combine the most recent research findings to neutralize urushiol.

A clinical experiment involving use of a zirconium-containing preparation showed that 39 of 47 persons exposed to poison ivy obtained relief within one day after treatment began. Another study showed that use of a zirconium preparation prevented appearance of dermatitis from poison ivy when applied to skin of susceptible subjects within an hour after exposure.

Zirconium is used in ziradryl and combined with the hydroxyl groups of urushiol neutralizing its effect. Parke-Davis, which also has a cream form of the product, uses benadryl hy-

(Continued on page 187)

Chlorpromazine As A Preanesthetic And Tranquilizing Agent In Veterinary Medicine

JOHN H. GRAVES,* D.V.M., Levittown, Pennsylvania

DURING the last several years many therapeutic applications have been found for the new drug chlorpromazine,† particularly in psychiatry, obstetrics, and surgery. The drug is now widely used in the treatment of mental and emotional disturbances, alcoholism, nausea and vomiting, protracted hiccups, asthma, and intractable pain; it has become an important preanesthetic agent. In veterinary medicine, however, comparatively little use has been made of chlorpromazine, and few veterinarians have published their findings with the drug. (There is an extensive literature, of course, concerning the effects of chlorpromazine on laboratory animals.)[1,2,3,4]

This paper is a report on some 14 months' use of the drug in a small animal practice; over 100 dogs were treated. The paper summarizes the results obtained with the drug in preanesthesia, minor surgery without anesthesia, the sedation of excited, irritable animals, the dressing of wounds, and the tranquilizing of animals in a state of post-traumatic shock.

Preanesthesia: Materials and Method

There are several persistent problems in the anesthetization of dogs. One is vomiting, which may be induced preoperatively by the preanesthetic agent (*e.g.*, morphine) or postoperatively by the anesthetic (*e.g.*, ether). Another is reflex irritability, which often makes intubation difficult for the animal and trying for the anesthetist. At the outset one is frequently faced with an apprehensive or hostile animal that is difficult to handle.

Since it appeared that chlorpromazine might be useful in lessening these difficulties, the drug was administered preanesthetically in a series of surgical procedures with 84 dogs. Administration of the drug was intramuscular. The dosage was either 25 mg., for animals weighing over 12 lb., or 12 mg., for animals weighing from 5 to 12 lb.; none of the dogs weighed less than 5 lb. From 30 to 45 minutes after chlorpromazine administration, anesthesia was induced with pentobarbital sodium, thiamyl sodium,® or ether. (Two dogs received thiamyl sodium; of the remaining animals, half received ether, and half pentobarbital.) The route of administration with pentobarbital was sometimes intravenous, sometimes intraperitoneal; with thiamyl administration was intravenous. Ether was given by the open drop method. The surgical procedures that were carried out are enumerated as follows:

Operation	No. Cases
Ovariohysterectomy	63
Cesarian section	2
Intestinal section	1
Splenectomy	1
Fractures	
external fixation	7
open reduction	1
Diaphragmatic hernia	1
Abscess (superficial)	5
Luxation of hip joint	3

Results

In every dog chlorpromazine had a tranquilizing effect that facilitated the administration of the anesthetic. Bronchial reflex irritability seemed to be reduced, as induction of anesthesia was invariably smooth. This ease of induction was in marked contrast to the stormy induction associated with the preanesthetic use of morphine. With ether, the time necessary for induction was generally no more than two minutes. With the barbiturates, the time required for surgical anesthesia was from 10 to 20 minutes where administration was intraperitoneal, and from one to two minutes where it was intravenous.

There was a reduction in anesthetic dosage of from 20% to 60%. It appeared that a single injection of pentobarbital at the reduced dosage would maintain anesthesia from 40 to 60 minutes — essentially the same time provided by a full dose without chlorpromazine. (See chart I.) Only small amounts of ether were needed

*Presently associated with Research Staff, Plum Island Animal Disease Laboratory, Box 848, Greenport, Long Island, N. Y.

†Thorazine—Smith, Kline & French Laboratories, Philadelphia, Pa.

®Surital Sodium—Parke, Davis & Co., Detroit, Mich.

to keep up the proper anesthetic levels; in the course of an operation, no ether at all was administered for two-thirds of the time. It is believed that the reduction in anesthetic dosage made possible by chlorpromazine was a factor in the successful outcome of two operations (the intestinal section and the splenectomy) on animals that were considered to be poor surgical risks. Generally it was imperative to give a reduced dose of anesthetic to avoid undue prolongation of anesthesia and any danger of extreme hypothermia or hypostatic congestion.

It is significant that vomiting did not occur in any animal, either preoperatively or postoperatively, even where ether was the anesthetic. Emergence was quiet in all cases. Here again a comparison is suggested with morphine, which seems to lead to a stormy emergence whenever it is used preanesthetically. With chlorpromazine the animals all passed from anesthesia into a light sleep lasting up to four hours, from which they could be easily aroused.

Chlorpromazine potentiated anesthetic to produce relaxation that made manipulation easy in the reduction of fractures and luxations. In both cases of cesarian section, fetal respiration was easily induced and strong; respiratory depression might have been expected had morphine been the preanesthetic agent. One animal with diaphragmatic hernia died after anesthetization with pentobarbital, and one ovariohysterectomy was fatal.

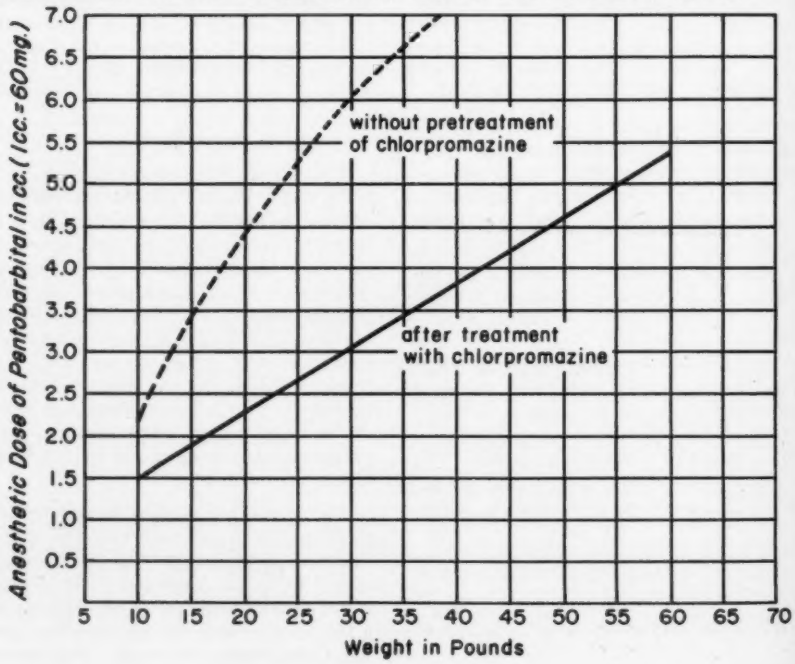
Various Tranquilizing Uses of Chlorpromazine

Pain in small animals is apt to cause excitement, which only mounts when the animal is thrust into strange surroundings. Instead of a tractable pet, the veterinarian must frequently deal with a highly irritable, frightened animal. Every direct attempt to give medical aid to such an animal, if only to change the dressing on a wound, meets with hostility.

Chlorpromazine was administered to a number of dogs in just such a state of irritability. The drug proved to be an effective tranquilizer, paving the way for various therapies. Special use was made of chlorpromazine in quieting dogs before minor surgery not requiring anesthesia. For example, five dogs received the drug before the opening and draining of super-

CHART I

EFFECT OF CHLORPROMAZINE ON PENTOBARBITAL DOSAGE REQUIRED FOR SATISFACTORY SURGICAL ANAESTHESIA



ficial abscesses; throughout these procedures the animals remained relaxed and passive enough so that only moderate restraint was necessary. Similarly, chlorpromazine facilitated the cleaning and dressing of minor but bothersome wounds. As was customary, no narcotic was administered; but chlorpromazine produced relaxation in the animals and evidently lessened their discomfort under handling. Other irritable conditions such as itching in eczema, and coughing in intractable bronchitis were also relieved by chlorpromazine.

About ten dogs received chlorpromazine following accidents in which most of them had sustained fractures. When treated, they were in a state of shock (blanching of the mucous membranes, increased and weakened pulse rate, stupor), but no animal was unconscious or bleeding heavily. Here again the use of chlorpromazine seemed to nullify the animals' concern with pain. No adverse effects from the drug were noted.

Summary

Chlorpromazine was used for 14 months in treating over 100 dogs. Single 25 mg. or 12 mg. doses of the drug were given intramuscularly as a preanesthetic agent in 84 surgical procedures. Anesthetic induction—with pentobarbital sodium, thiamyl sodium, or ether—was in all cases smooth. The anesthetic dosage was reduced by 20—60%. Emergence from anesthesia was invariably quiet. No vomiting occurred, either preoperatively or postoperatively. Because of its antiemetic property and its beneficial effect on bronchial reflex irritability, chlorpromazine seemed preferable to morphine as a preanesthetic agent.

Chlorpromazine proved useful in tranquilizing excited, irritable animals for various therapies such as minor surgery and the dressing of wounds. It was also useful in checking itching and coughing, and, as "first aid" after accident, in relaxing dogs with fractures and other injuries.

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Ethics may be defined as the science of moral duty.

"Leaflets Three"

(Continued from page 184)

drochloride and camphor in ziradryl for their anti-pruritic benefits.

Many home remedy treatments for ivy poisoning are still popular, although questionable.

For example, the theory of cleansing the affected area with a strong household soap and plenty of scrubbing is "an old wives tale," according to dermatologists. The scrubbing could increase the irritation. The use of calamine lotion remains popular in treatment because of its astringent (drying) qualities.

In all cases, however, treatment to be effective must begin as soon as possible after exposure.

The poison ivy plant, which does not exist in Europe, was encountered about the time America was discovered. First reports of it were written 350 years ago by Capt. John Smith, who landed at Jamestown, Va., in 1607 as a member of a colonizing expedition from England.

Years have not altered the after effects of exposure, which closely resemble the captain's written description: ". . . Being but touched [poison ivy] causeth redness, itching and lastly blisters, and which, howsoever, after a while pass away of themselves, without further harm; yet because for the time they are somewhat painful, it hath got itself an ill name, although questionless of no ill nature."

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Operations Cost

In his address concerning practice economics, Dr. C. L. McGinnis, Peoria, Ill. gave the following as the average costs of operations of a limited number of small animal hospital practices in the Midwest:

Salaries (assistant & employees)	35.0%
Drugs, biologics, etc.	10.0%
Food for patients	5.8%
Utilities	3.7%
Depreciation on physical equipment (or rent)	4.5%
Miscellaneous costs	8.0%
Net Profit	33.0%

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Public health officials are investigating the possibility of *Clostridium welchu* as a possible contaminate of poultry or other meat, being responsible for outbreaks of food poisoning recently reported.

Clinical Evaluation Of Prednisone-Penicillin Combination

R. B. KOGER, D.V.M., Joplin, Missouri

METICILLIN* is a new corticosteroid-antibiotic combination which appears to exert an effective synergistic action. It combines 10 mg. of prednisone (meticorten),® and 300,000 units of procaine penicillin G per cubic centimeter. The concomitant action produces more rapid and complete relief of symptoms than either drug alone in a variety of conditions observed in small animal practice. Meticillin has been found to be efficacious in practically all febrile conditions and has proved a useful adjunct when administered pre- and postoperatively in surgical procedures. Action is two-fold:

1. Meticorten has proved valuable as supportive therapy in the treatment of shock and stress following major surgery or severe injuries. Experimental work indicates that systemic stress caused by infections or trauma is due to relative corticoid insufficiency which responds to corticosteroid therapy.

At the same time, the anti-inflammatory action of the Meti-steroid permits the antibiotic to act more efficiently and is believed responsible for the more rapid action of the new combination reported. Meticorten assists animals to overcome stress of febrile conditions and operative procedures.[1]

2. Gram-positive organisms are susceptible to penicillin. Activity of this antibiotic is unaffected by pus, serum, blood, or tissue fluid.

Although it has been reported that an increasing number of penicillin-resistant micrococcal (staphylococci) strains are responsible for various disorders the problem of resistant pathogens has not become clinically evident in this practice.[2]

The new corticosteroid-antibiotic combination has proved efficacious in a wide range of disease conditions in small animals. (See tables 1, 2.) These include nonspecific dermatoses (particularly moist summer eczemas), otitis media, arthritis, and rheumatism, tracheobronchitis (kennel cough), and a number of other disorders refractory to other forms of therapy. It has proved especially useful for the treatment of wounds and abscesses in both dogs and cats.

Risks of shock and infection are minimized by presurgical treatment which has come to be relied upon in our practice. Patients appear to respond by less evidence of stress and shock following major surgery. Secondary infections are of lesser concern since it is in almost routine use.

Nonspecific Dermatoses

In nonspecific dermatoses, meticillin or meticorten alone are equally effective, but in the moist or "hot spot" form of summer eczema the new combination of corticosteroid with antibiotics is even more effective than its parent corticosteroid. This superiority probably is due to the bactericidal action of penicillin on those infections commonly isolated in the "hot spot" type of lesion. (In effect, this finding substantiates the theory of cutaneous micrococcal infection as the etiology of the condition.)[3] Dosage employed is 1 cc. for each 25 lb. of body weight. This is a lesser quantity of prednisone than is usually required to control the condition when given alone. For this reason a favorable synergistic effect is likely.

"The combined use of steroids and other antibiotics in dermatological diseases has been reported as constituting exceptionally effective therapy by other clinicans. Consensus at this time is "that such combinations are superior to either drug used singly."[3]

Cases characterized by pruritus without gross lesions and those that fail to respond to the recommended dose of the combination product were treated successfully by meticorten alone at the rate of 1 mg. per lb. of body weight.

Otitis Media

Several cases which had been highly refractory to other forms of therapy responded rapidly to the prednisone-antibiotic combina-

*T. M.,® Schering Corporation, Bloomfield, N. J.

The meticillin and chlor-trimeton used in this clinical evaluation were supplied by Dr. J. C. Siegrist, Director, Department of Veterinary Medicine, Schering Corporation, Bloomfield, New Jersey.
Mrs. Mathias P. Genser assisted in the preparation of this paper.

TABLE 1. Uses of Meticillin in Small Animals (Medical Cases)

Species	No. Cases	Diagnosis	Results Gd.	Fr.	Pr.	Remarks
Feline	8	Pneumonitis	5	2	1	Shortened course
Canine	154	Summer eczema*	122	18	14	See text
Feline	3	Nonspecific dermatitis	2	1		Animal showing least response given 5 doses
Canine	4	Infectious canine hepatitis	3	1		Remarkable effect when given early
Canine	10	Otitis media (varying degrees)	10			Cured most advanced cases with supportive aid
Canine	8	Tonsilitis	7	1		Excellent response in 1 to 3 doses
Feline	9	Fight injuries and abscesses	9			Treated for 1 to 3 days
Canine	4	Fight injuries and abscesses	4			Treated for 1 to 3 days
Canine	2	Tetanus			2	Both dogs died within 2 days of onset
Canine	2	Distemper chorea		1	1	Euthanasia 1 case
Canine	21	Bronchitis	16	3	2	Responded well after 2 to 4 doses
Canine	1	Acute peritonitis			1	Moribund when admitted — died in two days
Canine	2	Histoplasmosis			2	Gave temporary boost— Euthanasia performed
Feline	3	Cystitis with passage of blood	3			Completely cleared after 2 doses
Canine	5	Obscure lameness, sprains	5			Pain alleviated
Canine	2	Mammitis	2			Excellent response in 2 to 3 doses
Canine	3	Cystitis	3			Also used (diluted) as irrigation
Canine	3	Leptospirosis	3			Dramatic response in one advanced case with BUN of 380 mg./%

tion. In these cases a mastitis preparation containing prednisone and penicillin-dihydrostreptomycin (metibiotic)® complemented parenteral therapy.

Arthritis and Rheumatic Disorders

Meticillin appears to give relief in cases of arthritis and rheumatism for longer periods than meticorten alone, possibly because of complicating low grade infections of the anal sacs, teeth, tonsils, or other tissues.

Tracheobronchitis

This troublesome condition responds well to the use of the new combination, most uncomplicated cases requiring only two or three injections. Usually no other treatment was necessary, although in chronic cases an additional dosage of 1 cc. per 25 lb. of body weight was given on alternate days.

Abscesses and Infected and Traumatic Wounds

We have come to prefer the prednisone-antibiotic preparation in the treatment of abscesses and wounds in both dogs and cats. After the abscess is drained and the wound treated locally, meticillin is injected daily for a period of one to five days depending upon severity.

Tonsilitis

Good to excellent response was noted in animals treated for this condition. One case, a Pointer was anemic on admission (hematocrit 1.2). Remission of fever was obtained for about 48 hours with one injection of 2 cc. Following treatment for anemia, tonsils were removed without complication and complete recovery followed.

Virus Infections

Meticillin has been used as supportive therapy in such virus disease as feline pneumonitis and panleucopenia, infectious canine hepatitis, canine distemper, and others. Its value lies in its anti-inflammatory action and its inhibition of secondary bacterial infections.

Side Reactions

Meticillin produced an allergic reaction in about 10% of the cases treated. In all but one instance this reaction occurred within ten

*In all cases, unless otherwise noted, the dosage schedule was 1 cc. per 25 lb. body weight.
Gd. = Good; Fr. = Fair; Pr. = Poor.

minutes after the drug was administered, and was of a fairly acute urticarial nature.

One Greyhound developed a drug reaction nearly two hours following administration of 2 cc. of the drug.

TABLE 2. Uses of Meticillin in Small Animal Practice (Surgical Cases)

Species	No. Cases	Surgery	Results and Remarks
Canine	2	Intramedullary pinning—mandibular fracture	Excellent results—no osteitis developed—3 doses postoperatively on successive days.
Canine	4	Unilateral perineal hernia (Koger method) (polyethylene sponge)	Administered also 3 day postoperative. Excellent results.
Canine	1	Corrected rectal stricture	Obtained optimum results with 3 doses postoperatively.
Canine	5	Cesarian section	One dose following surgery gave excellent results in each case.
Canine	6	Intramedullary pinning—fractured femur	3 doses postoperatively gave excellent results in each case.
Canine	1	Femoral hernia (bilateral) female	Response to 3 doses postoperatively; male patient developed no swelling or edema of prepuce as usually is expected.
Canine	1	Femoral hernia (unilateral) male	
Canine	6	Pyometra	Results good in all cases.
Canine	2	Urinary calculi (females)	Excellent results
Canine	1	Bone grafting	Excellent results. Donor graft soaked 24 hours in solution (10 cc. N. saline, 2 cc. meticillin, 1 gm. streptomycin.)
Canine	7	Dental work on aged animals under general anesthetic. Extraction of 2-8 teeth and tartar scraping.	Excellent results. Administered preoperatively
Canine	2	Extirpation of eye (polyethylene sponge inserted in cavity)	Excellent results.
Canine	1	Hydrocele—left kidney—drained and resected	Complete recovery.

Atkinson[4] advances an interesting theory concerning this phenomenon. He suggests that prednisone causes an almost immediate absorption of the penicillin into the blood stream with a concurrent reaction as is seen sometimes with the intravenous administration of certain drugs.

Such symptoms of hypersensitivity were immediately controlled by the use of antihistamines. Chlorprophenpyridamine maleate (chlor-trimeton® maleate), the potent, well-tolerated antihistamine which clinicians have found to be particularly effective in the prevention of reactions to penicillin and other parenterals, was given in doses of 10 mg. Since release of this product for general professional use, the number of undesirable reactions noted has been negligible. No allergic reactions have been observed in cats.

Polydypsia and polyuria, frequently reported by dog owners following the use of prednisone have not been observed with the use of meticillin.

Comment

Meticillin is suitable for deep intramuscular injection with a minimum of pain or local tissue reaction. Following intramuscular injection of 300,000 units of penicillin in the small animal, penicillin blood levels can be detected for 24 hours, though often these are below that considered desirable or effective. Frequency of administration and dosage must necessarily be governed by the patient response and the course of the disorder; the majority of cases responded well to one to three doses.

Summary

1. Meticillin is one of the most effective single agents in the treatment of practically all febrile and surgical conditions in small animals.

2. Meticillin occasionally produces the side reaction of allergic dermatitis, but this difficulty is easily overcome with the use of an antihistamine.

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Management of Human Exposures to Rabies

The medical management of patients possibly exposed to rabies virus often presents difficult and serious problems. These are concerned chiefly with the alternate dangers of serious vaccine reactions (treatment paralysis) and the possibility of clinical rabies following unprotected exposure to virus.

All bites inflicted by animals should be treated as potentially infected wounds and thoroughly cleansed with soap and water or a detergent solution. This does not preclude more drastic treatment if indicated. Ordinary antiseptics and antibiotics have no prophylactic value against the rabies virus but may be used to combat bacterial infections. A prophylactic dose of tetanus toxoid may be administered as indicated as in any other potentially infected wound.

Indications for specific prophylaxis as formulated and recommended by the Expert Committee on Rabies of the World Health Organization are presented in the accompanying table.

The hyperimmune serum referred to in the table is antirabies serum (Lederle). Its use is recommended as indicated and in accordance

(Continued on page 193)

Rabies — Indications for Specific Post-exposure Treatment†

Nature of Exposure	Condition of Animal: At Time Of Exposure	Condition of Animal: During Observation Period of 10 Days	Recommended Treatment††
I. No lesions Indirect contact only	Rabid	—	None*
II. Licks			
1. Unabraded skin	Rabid	—	None*
2. Abraded skin and abraded or unabraded mucosa	(a) Healthy	Healthy	None
	(b) Healthy	Clinical signs of rabies or proven rabid	Start vaccine at first signs of rabies in animal
	(c) Signs suggestive of rabies	Healthy	Start vaccine immediately. Stop treatment if animal is normal on 5th day after exposure**
	(d) Rabid, escaped killed or Unknown	—	Start vaccine immediately
III. Bites			
1. Simple exposure	(a) Healthy	Healthy	None
	(b) Healthy	Clinical signs of rabies or proven rabid	Start vaccine at first signs of rabies in animal
	(c) Signs suggestive of rabies	Healthy	Start vaccine immediately. Stop treatment if animal is normal on 5th day after exposure*
	(d) Rabid, escaped killed or unknown, or any bite by wolf, jackal, fox or other wild animal	—	Start vaccine immediately
2. Severe exposure	(a) Healthy	Healthy	Hyperimmune serum immediately. No vaccine as long as animal remains normal
(Multiple or face head or neck bites)	(b) Healthy	Clinical signs of rabies or proven rabid	As in III, 2, (a), but start vaccine at first sign of rabies
	(c) Signs suggestive of rabies	Healthy	Hyperimmune serum immediately, followed by vaccine. Vaccine may be stopped if animal is normal on 5th day after exposure
	(d) Rabid, escaped killed or unknown. Any bite by wild animal		Hyperimmune serum immediately, followed by vaccine

†Suggestions of Special Committee on Rabies, World Health Organization.
††These indications apply equally well whether or not the biting animal has been previously vaccinated.
*Start vaccine immediately in young children and patients where a reliable history cannot be obtained.
**Alternative treatment would be to give hyperimmune serum and not start vaccine as long as animal remained normal.
Hyperimmune serum to be effective must be given within 72 hours of exposure.

So You Have to Make a Speech

ERNEST W. FAIR, Boulder, Colorado

Every veterinarian at one time or another has to make a speech, or several of them, before a civic group, a farm club, a convention, or what have you. And when that time comes he wants to make the best possible speech in the best possible manner.

An executive friend of the writer found himself in such a dilemma the other day, so he asked that we give him some ideas that would help. We asked many public speakers pertinent questions, did some "boning" among the sages on the subject and came up with a list of suggstions which enabled our friend to pull through with proverbial "flying colors."

He suggested that there were undoubtedly some other executives who would benefit, so here are the pointers he found helpful:

1. Say it your own way. If you want to avoid sounding like a stuffed shirt, speak in the same style and language you use in your everyday life; it will come natural — any other way will be forced. If you pick up some data or information somewhere, present it in your own words, not those of the source.

2. Talk louder than you have to. Not only will you be heard clearly, but instinctively you will put more effort into what you say when you talk louder than normal.

3. Change the pitch of your voice. One pitch gets horribly monotonous. Whisper some, yell out cn another point and use your normal voice, but vary the pitch of your voice throughout the speech.

4. Keep your points down. You will make a much more lasting and worthwhile impression if you limit your message to three or four well emphasized points than if you attempt to "snow under" the audience with a deluge of facts and fancies.

5. Leave things alone. That means the necktie, the watch chain, the "specs" or anything else that attracts the attention of the audience away from what you are saying and to what your hands are doing.

6. Look good. A good appearance means much toward getting the favorable attention of your listeners. Don't do as many business and professional men have a habit of doing . . . making the speech in the same clothes you have squirmed around in all day long.

7. Watch for repetition. Nothing ruins a good speech faster than constantly repeating a pet cliche or even a pet word. If it's good, it will register the first time it's heard; if not, then it is best not even mentioned once.

8. Stand still. Stand in the same position as much as possible; don't put on a military drill in front of your audience. They are not interested in such antics. It detracts from what you are saying.

9. Don't droop. It pays to stand on your toes when you talk. Don't sag or relax. It also pays to remain alert throughout the whole ordeal no matter how tired you may be, and give the audience the impression that you are full of energy and "rarin' to go" every minute you are talking.

10. Put on a good show. Your speech should be the high point of the evening's program; do your best to see that it is. The executive who begins his speech firmly convinced that he can give a better speech than the "guy" who preceeded him or the one who spoke last week IS going to give a better speech.

11. Work hard on the ending. It doesn't pay to have a top notch speech and an excellent delivery and then have the whole thing ruined by a bad ending. Say or do something the audience can enter into, can feel a part of, and can feel that they have really heard something which was worth the time they spent listening to you.

12. Never apologize. Make no excuses for the weather, the speech, its length, the hour, your voice, or anything else. People don't want to listen to such things. If you call attention to some small thing, the imagination of your audience will seize upon it and magnify it. If there's anything wrong, it is better to cover up the whole business and forget it; maybe no one will notice the situation anyway.

13. Time yourself carefully. The most common mistake of the first time speaker is to go to one of two extremes. He either makes his speech too short or too long. A good point can not be put over effectively in the average speaker's short speech (few of us can ever reach the heights of Lincoln's speech at Gettysburg) and on the other hand, dragging something out only buries it in dreariness. Timing is of the utmost importance in addressing any audience.

14. Be careful of jokes. A joke which has no point in your message doesn't belong there; if you must pull 'em, make sure they are well placed, well told and have some relation to your speech. Avoid dialect jokes — it takes an expert to put them over.

15. Surprise your audience. An unusual twist in the process of speech making always wins an audience's friendliness as, for example, with one speaker we knew who stood on the platform leafing through some 100 typewritten pages of notes as he was being introduced. We all groaned inwardly at the prospect of a long and very dull speech ahead of us. Instead the speaker looked straight at his audience and remarked that he was sure no one was interested in what he had worked up for a speech, threw the whole batch of typewriter paper into the wastebasket, and proceeded to give one of the best informal speeches we have ever heard.

16. Be sure of pronunciation. All of us have a habit of mispronouncing a few words and usually are never aware of what we are doing. However, when these are so spoken even in a speech before a small audience, they stand out like the well known "sore thumb" and can ruin the whole receptiveness of an audience.

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Incidence of Rabies

Statistics on the number of cases of rabies in the United States during calender year 1956 have been reported by the Dr. J. L. Hourrigan, chief, Special Disease Eradication Section, Animal Disease Eradication Branch, Agricultural Research Service, USDA, in a special branch notice.

Material is a compilation from a questionnaire to veterinarians-in-charge and to health officers in each state.

A total of 5,846 cases of rabies were reported of which 2,592 affected dogs; 700 cattle, 30 horses, 22 sheep, 30 swine, 371 cats, 12 goats, and 2,079 miscellaneous domestic animals and wildlife. This is the smallest number reported for any one year since 1938 and is slightly lower than that reported for 1955. Actual number of cases probably is greater since some are not diagnosed or reported to state officials.

Texas, Louisiana, Alabama, and South Carolina have the devious distinction of highest incidence of rabies in all species in the order given. Number in these states are only a little greater than in the Ohio River states of Ohio, Kentucky, and Indiana where the disease has constituted a rather serious threat to public health for the past several years. Number of confirmed cases in foxes added materially to the totals reported in Louisiana (290), Texas (138), Alabama (113), Georgia (116), Virginia (136), and New York (99). Skunks determined diseased also added materially to total reported by California (120), Minnesota (106) and Iowa (105).

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Ocular Defects Common to Breeds of Dogs

Roberts in the Dec. 1956 *All-Pets Magazine* (page 49), discusses informatively, from the standpoint of heredity, visual defects in dogs presumably a sequence of extensive inbreeding practiced in the development of these animals. In Chows entropion is observed, though in St. Bernards its opposite or extropion is common. Dogs with short faces such as Cocker Spaniels, Boxers, Pekingese, and Pugs frequently have poor eye drainage because the lacrimal duct is not capable of carrying off tears so that the latter discharge over the face. Other breeds with a short head — the designated brachycephalics such as Boston Terriers, Boxers, Pekingese, and Pugs have prominent large eyes that have a tendency to leave the orbital cavity as a result of injury. On the other hand the Collie has such small deep set eyes that lid deformities occur. The Wirehair Fox Terriers and the Sealyhams have a weakness of the lenticular suspensory apparatus so that the lenses become displaced, and with glaucoma as a complication, result in blindness. German Shepherds may have pterygium resulting in corneal opacity. Other defects that are classed as congenital, are dermoids of the globe and even cataracts in puppies. Many of these conditions are acceptable from the standpoint of breed standards, but as Doctor Roberts observes many of them are nevertheless actual diseases.—*R. R. Dykstra, D.V.M.*

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Bacteriologists have determined that the virulence of the organism *Pasteurella tularensis*, etiological agent of tularemia, (rabbit fever) is attenuated by residence in birds.

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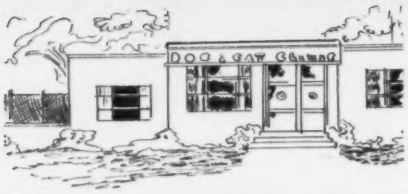
Management of Human Exposure to Rabies

(Continued from page 191)

with the instructions in the pamphlet accompanying the serum. Usual dosage is 1,000 units for each 40 lb. of body weight or fraction thereof. Rabies vaccine loses its potency rapidly, having a total potency period of only six months.



CLINIC

CLIFFORD L. McGINNIS, D.V.M.

Peoria, Illinois

I like the phase of veterinary medicine that is devoted to small animal or pet practice. It seems that the longer I work at it, the easier it becomes. That the work is easier may be good or bad. One of my physician friends expressed a truism recently when he stated that a young graduate works hard to establish a practice; he answers calls day and night, neglects his family, and establishes a niche in his community. By the time he has a substantial clientele, he is too old to do all the work that is presented, so he neglects them or keeps uncertain office hours, and soon his clients go elsewhere. He has made the full circle and is back where he started.

The work becomes easier as we go along for only one reason. We have developed a better understanding of the client and his pet, and that is what I want to visit with you about — clinical cases, and the people that bring them to you for treatment.

Let's start out with the fundamental point that you do not practice veterinary medicine because of any inherent right. You have had to earn that privilege and must now conduct yourself so that you may continue to enjoy it.

By the same token, no person is under any compulsion to bring his or her pet to you for treatment. You have not sent them an invitation or called them on the phone; they come of their own free will. This is the foundation for and the basis of a doctor-client relationship. You have been accepted by that client as an expert and the minute he enters your examination room, he owes you a professional fee.

Remembering these fundamental points will help make practice easier. As an example, a man and his wife came to my office with a three-year-old miniature Doberman. They had moved recently from St. Louis where a veterinarian had enjoyed the fullest confidence of this client. In the process of this satisfactory doctor-client relationship, this man had learned a smattering of medicine which he duly distilled into several overbearing medical pronouncements. His dog was suffering from a severe case of tonsilitis. The animal had had it three times previously and each time the St. Louis veterinarian had administered 1 cc. of penicillin in the hind leg. The dog would be real sick for five hours and then be well. So that's what he wanted and I gave the 1 cc. of penicillin in the nape of the neck so the leg wouldn't be sore, but I also added a prescription for a different antibiotic. I guess my penicillin was different because it took the dog two days to recover. The owner was quite disturbed. If I had followed my first impulse, the resulting altercation might have gotten out of reasonable control. But by tactfully allowing this client's scope of knowledge full play, we together got the dog well and in time the client turned out to be a fairly decent Joe.

If one stays in practice through the years, one develops a sixth sense that I like to call clinical sense. It is the ability to distinguish between health and disease. By it, you immediately decide whether a dog is sick from eating garbage and will recover with an enema, or is suffering a nephritis or leptospirosis or some other disease. You see a female cat and you know it is only enjoying estrum in spite of the owner's well described symptoms. You distinguish coughs, cardiac, post-distemper, or bronchotracheitis, as the case may be. It is this clinical sense that takes some of the worry out of practice. It also confounds the junior student who is spending the summer with you.

You'll discover on the 2:00 a.m. phone call that one-half aspirin tablet every hour is as good as seeing the pet, because the owner will stay up all night anyway. By 8:30 a.m. the pet will be getting well or exhibiting symptoms readily diagnosed. Of course there are exceptions, such as obviously poisoned dogs, eclampsia, or dystocia. These are few and far between.

I think only about 1% of our night calls are really emergencies. For instance, last night there were three: A Cocker Spaniel paralyzed on his hind legs since evening, a three-year-old Pekingese that was sneezing and a Chihuahua that seemed in labor, but was five days early.

By this morning the Cocker was walking and the owner remembered that the animal had been loose in the alley. After an enema the Cocker passed material obviously from a garbage can.

The Pekingese did have a cold all right but not serious. It had had distemper as a puppy.

And we delivered four good healthy pups from the Chihuahua at 10:00 a.m. by cesarian section.

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Veterinary Medicine In The South-A Challenge†

BRIGADIER GENERAL WAYNE O. KESTER,* U.S.A.F. (VC), Washington, D.C.

I liked the subject you assigned me for discussion here — Veterinary Medicine in the South. It seemed like something fresh, different, a new interest. Yet, after some rather careful researching I have concluded that veterinary medicine in the South is not much different from veterinary medicine and science elsewhere in this great land of ours. It involves the same people, same interests, same unsolved problems. Only in degree and minor aspects is there variance.

Our problems are the same everywhere and it is these problems I should like to discuss here.

First, who makes up the veterinary profession? The best veterinary schools in the world are here in this country and Canada — 19 of them turning out about 1,000 graduates a year. These graduates spend six to eight years in college being thoroughly schooled in the basic and medical sciences on a level comparable to the schooling received by doctors of medicine — the difference being principally that the veterinarian studied all animals and is also schooled in the agricultural sciences whereas the physician is concerned only with the human animal. A vast majority of the country's veterinarians have been graduated within the past 15 years — so we are a young profession — so to speak.

What are these doctors of veterinary medicine doing and where are they located? Of the 18,000 in the United States only two thirds are engaged in the practice of clinical veterinary medicine. Most people are astonished to learn that teaching, research, commercial industry, disease regulatory programs, and public health activities demand the services of one third of our profession — a demand that is ever increasing. Of interest here is the fact that nearly one fourth of our 18,000 veterinarians are located in the 14 southern states — 180 here in Louisiana.

While there is room for many more in this state, as well as the rest of the 48, we have arrived at a point where this country is no longer confronted with a shortage of veterinarians. We now have and will continue to have a mature, vigorous, well-trained, and well qualified veterinary profession. A shortage of veterinarians can no longer be used as an excuse for not solving animal disease problems or for allowing the terrific economic loss caused by animal diseases to continue.

With an estimated annual toll of $2,700,000,000. due to animal diseases and parasites there is no question but that we have some problems. But are these veterinary problems or are they in fact problems of the livestock owner, the consumer, and the tax payer?

If you are a livestock owner divide that $2,700,000,000. by your number and you can see that it may easily be costing you the difference between a profit and a loss in your

Louisiana Veterinary Research Center

Research facilities costing more than $600,000. have been added to the Veterinary Research Center at Louisiana State University, Baton Rouge. Dedication ceremonies were held on January 29, 1957, in conjunction with the 26th Annual Conference for Veterinarians, at which occasion Brig. Gen. Wayne O. Kester, president of the A.V.M.A., delivered the address published herewith. Other prominent speakers included Dr. B. T. Simms, director of Animal Disease and Parasite Research Branch, Agricultural Research Service, USDA, and Mr. Kenneth Cagle, Lake Charles cattleman and member of the House of Representatives.

The expanded Center consists of six animal laboratory buildings and a large two-story addition to the Dalrymple Memorial Laboratory. Special laboratory equipment has been made available to make possible a variety of studies; designed to search for answers to some of the South's livestock disease problems.

Dr. W. T. Oglesby, head of the Department of Veterinary Science, and director of the Center stated that projects had already begun on anaplasmosis, leptospirosis, gastrointestinal parasitism, and vibriosis. These especially were scheduled for exhaustive research at the request of veterinarians and farmers because of seriousness of losses caused by attacks. Anaplasmosis, for example, was estimated to be responsible for $10,000,000. annual loss in the southern states.

A staff of nine researchers are now engaged in the studies, with several more to be added in the near future.

†Address presented at the dedication program, Veterinary Medical Research Center, Louisiana State University, Baton Rouge, January 29, 1957.

*General Kester is President of the A.V.M.A. Office of the Surgeon General, Hdq. U. S. Air Force, Washington 25, D. C.

operation. Or as a consumer divide that $2,700,000,000. loss by your number to see how it may be affecting your grocery bill. It comes out $16. each for every man, woman, and child in this country.

Why do we have this terrific loss? First, the livestock owner and the public are generally unaware of the enormous price they are paying for inattention to animal disease problems. In fact many are unaware that such problems exist.

Second, existing scientific knowledge about animal disease prevention and control is not being fully used by the livestock man, the farmer, the poultryman and other producers. This constitutes a real challenge to our Agricultural Extension Services and other educational agencies.

Third, sufficient research has not yet been done to provide the knowledge and materials needed by the producer to prevent these losses. You may think this is a challenge to the veterinary research worker but I think not. Given the facilities and equipment he will accomplish the research and find the answers.

The real challenge is to the livestock owner, the producer, the consumer and the taxpayer because until they recognize the problem as their problem and provide facilities and means whereby veterinary science can get busy on the solution, animal diseases will continue to extract their staggering toll, both economic and in human health.

This splendid research institute we are dedicating here today attests to the facts that the people of Louisiana are quite aware of their problems and have reacted in a positive and most commendable manner.

Splendid as this institution is, it is not the sole answer. It is in fact but the beginning because it requires funds and skilled veterinary scientists to make it produce.

Here is where we run into trouble because we are not using our research scientists or our research funds as wisely as we might. For example, $249,000,000. of public funds are going into agriculture research and regulatory programs this year — only 4.5% of which will be used on veterinary research. Of the millions of dollars, both state and federal, spent annually on agricultural research *less than 5% goes into veterinary research.* Yet livestock accounts for 54% of the total farm income — and the biggest single threat and tax on the livestock industry ($2,700,000,000. annually) is the still unsolved riddle of animal diseases. It is a riddle that can only be solved through research and a riddle that will not be solved until the livestock owner, the consumer and the tax payer demand and persistently insist year after year that ample funds be provided and spent on such research.

You as doctors of veterinary medicine practicing your profession know and well understand all I have said here. But do your associates, your neighbors, your clients, your newspaper editors, the consumer, the taxpayer and the public in general know what this lack of animal disease research and control is costing each of them? Of course they do not or they would demand and get corrective action.

Therein lies the real challenge to veterinary medicine, not only in the South but throughout our land. The challenge is in educating the public that so-called veterinary problems are not problems of the veterinary profession at all. They are public problems — problems of all the people — problems that veterinary science, with the help of an aroused public, can and will solve.

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Clean Eggs

The most profitable way to obtain clean eggs is by proper management of the sanitary program. Jack Hough of the University of Massachusetts (*Featherfax,* Nov. 26, 1956) outlines a program which has produced results by Massachusetts poultrymen who have followed it. The steps suggested by him are as follows:

(1) Examine every nest at regular intervals every week, setting aside specific times for this chore.

(2) Thoroughly clean every nest of manure, stained material and broken eggs.

(3) Add a liberal amount of clean shavings or nesting material to every nest.

Another step could be added and it is to gather the eggs at frequent intervals every day. —*W. R. Hinshaw, D.V.M., Ph.D.*

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Since 1934, more than 3,500,000 reactors to the seroagglutination test for brucellosis have been disposed of at a cost to the federal government of a little over $155,000,000.

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Although never isolated from bull semen, chance urethral contamination with *Leptospira pomona* of infected or carrier bulls is likely.—*H. S. Bryan, D.V.M.*

EDITORIAL COMMENTS

Creating a Demand for a Good Product

A hundred years ago Ralph Waldo Emerson wrote, "If a man has good corn, or wood, or boards, or pigs to sell, or can make better chairs or knives, crucibles or church organs than anybody else, you will find a broad, hard-beaten road to his house, though it be in the woods."

That's the origin of the much more familiar "If you build a better mousetrap" proverb that has been long cited to prove that a quality product is more important than advertising and promotion. But the adaptor of Emerson's words was guilty of a common conceit, for the above is actually out of context and should be prefaced with the following: "I trust a good deal to common fame, as we all must." If, for the phrase "common fame," a substitution of "advertising or promotion" is made, the better mousetrap theory doesn't hold much water.

Secretary of Agriculture Benson has not been the first, but certainly the most forceful to hammer home a similar argument to farmers and producers of meat food products. "In this competitive age the market goes to the man who creates a demand for his product and aggressively merchandises it," the Secretary commented. "Farmers should use ad technicians to improve the effectiveness of marketing just as they call on other technicians for better production."

What the Secretary really meant was that nobody is going into the woods after mousetraps unless he knows why he's going.

The following case report in the Secretary's own words may be allegorical to the producers of meat food products. It points up three key factors required for success: (1) Quality products, (2) competitive pricing, and (3) a first class promotional program.

"In our free American economy, the greatest and most lasting gains attained by any segment of the population have always been through their own efforts rather than through controls or aids administered by government. This is as true for agriculture as for any other group of our citizens.

"A case in point is that of the 3,000 extra-long staple cotton farmers of west Texas, New Mexico and Arizona, who as recently as two years ago were confronted with the biggest proportionate share of the surplus of any branch of the cotton-growing industry.

"Then through research, came the development of a high-yielding, superior quality extra-long staple known as Pima S-1. Banding together to form the Supima Association of America, these growers took the unprecedented step of asking Congress to reduce their support levels from 90% to 75% of parity, a cut of about $50 a bale. They then assessed themselves $3. a bale to set up an advertising and promotion campaign. And they continued their efforts to bring quality to a constantly higher level.

"Now — two years later — there is virtually no surplus of American extra-long staple. Indeed, the Department of Agriculture has found it necessary to almost double the extra-long staple cotton acreage allotment for the 1956-57 season.

"This campaign to build markets through improved quality, modern promotion technics and competitive prices is in keeping with the best American traditions. This program and philosophy are worthy of study and emulation by all agriculture."—*Ezra Taft Benson.*

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Penicillin-Salt Mix

Penicillin-salt mixture prepared by the Morton Salt Company is being made available in all sections of the country except the West Coast. Manufacturers report an unprecedented demand for the product named "Anti-Blote" salt.

The mix will be made available in 10 lb. boxes or 50 lb. drums. Estimate is that 10 lb. will be sufficient for ten cattle for 30 days. At this rate, cost per head should be about 2 cents per day.

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We must educate our livestock producers in the many ways that parasites affect his animals. We must teach him how anthelmintics work and why they must be used correctly. We must search constantly for better ways to curtail losses. We must learn to recognize the altered physiology and needs of parasitized animals and find ways to compensate for them. Our fight against parasites must be stepped up to meet an enlarging problem.—*Dean S. Folse, D.V.M.*

New Book — Infectious Diseases of Swine — Ready for Distribution

Infectious Diseases of Swine was launched as an article on hog cholera by Dr. H. C. Smith that appeared in the now memorable Anniversary Issue of VETERINARY MEDICINE, published for November 1955. The extension that proper consideration of the subject demanded soon led the author into comprehensive research on other infectious diseases of swine. With the enthusiasm of an explorer, Doctor Smith re-examined the voluminous accretions of professional literature that reflect the profession's concern with these diseases. In some hands the assignment might have resulted in superficial consideration of long forgotten articles, tracts, and reports. But to Doctor Smith the story unfolded with the fascination of passing slides in a stereoscope. That is why the student of animal diseases can find in this one book a more penetrating evaluation of problems and a more exhaustive list of references than might appear in a dozen scientific tomes.

The Author

For the greatest part of his professional lifetime, Dr. H. C. Smith has concerned himself with the veterinarian's increasingly effective attack on swine diseases. His personal contact has been as field consultant and diagnostician. His qualifications as well as his native interest are reflected in the tremendous amount of information and related understanding that emerge from 11 exciting chapters, totaling approximately 100 pages.

Infectious Diseases of Swine is in a sense a guide through the literature on a selection of the most common infections to which swine are subject. Although there can be but little doubt that this series of articles is "the most thorough reference and cataloging of publications ever assembled with regard to swine diseases," it is a reflection of the humility and dedication of the author that he recognizes disease problems as being far from solved.

"It seems almost paradoxical," Smith observes, "that despite great progress made in the last 50 years, disease processes continue to challenge the best trained and alert practitioner and scientist."

Available Without Charge

Recognizing the value of these articles, it was proposed by President J. L. McKee of Allied Laboratories, that they be assembled in book form and made available without cost to all veterinarians interested in swine disease problems. The editors granted exclusive reprint privileges and assisted in preparation and publication of the book. Mailings have begun to practitioners who are listed as engaged in swine practice. All others interested will be mailed a copy promptly on receipt of request on professional letterhead. Address — Allied Laboratories, Inc., Box 44, Kansas City 41, Mo.

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Lung Disease of Sheep

Yale University virologist Dr. Francisco Duran-Reynols has begun a research project into the strange epizootics of pulmonary adenomatosis which is decimating sheep flocks in several areas of the world.

The lung disease is reported rampant in and west of the Rockies, as well as in the Peruvian Andes, South African Veldt, Iceland, France, and parts of the British Isles. Affecting the glandular portion of the lungs of sheep and becoming apparent in animals two to three years of age the disease is possibly latent from birth. Only in Peru does the disease appear as true adenocarcinoma. It is contagious and invariably fatal everywhere.

Pulmonary adenomatosis is a disease of open range as contrasted to human lung cancer, which occurs most frequently in industrial areas. Origin is unknown although a number of theories have been advanced. Virus etiology will be carefully investigated at Yale.

Factors common to human lung cancer have interested the American Cancer Society to support the research work which is hoped will provide clues for etiology of both the sheep disease and human lung cancer. Dr. Edwin Jungherr, veterinary research scientist at the University of Connecticut will be associated with Doctor Duran-Reynols on this project.

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Piperazine Salts in Feeds

First permissible inclusion of piperazine in feed came recently when the Food and Drug Administration approved a new drug application for such use. More recently, according to *Feedstuffs* (Mar. 2, 1957) action was taken to exempt three piperazine salts (piperazine phosphate monohydrate, piperazine sulfate, and piperazine dihydrochloride) from F.D.A.'s "new drug application" requirements.

It appears certain from this action that expended use of the newest anthelmintic to mixed feed can be expected.

Clinic: New Department for the Small Animal Section

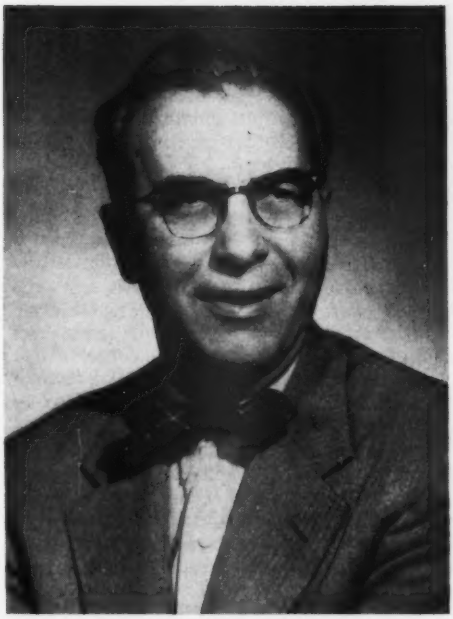
Dr. Clifford L. McGinnis, author of Clinic, is an affable practitioner of even-paced ways. His Midwest heritage takes in the roaring 20's and the depression-ridden 30's with schooldays and home life ranging from North Dakota to Kansas and Oklahoma. He was born at Hazelton, North Dakota in 1906, and graduated from high school in Valley Falls, Ks. in 1923. Both towns are so small that they seldom appear on comprehensive road maps.

With poker-player self sufficiency, young Clifford McGinnis enrolled at Kansas State College to become a veterinarian in 1924. He was to experience a staggering share of bad luck in the process, at one time dropping out of school to recoup finances at various nondescript jobs. In one five-year stretch he worked in restaurants, on magazine and car sales, as a grocery store clerk, and finally in a gasoline and oil distributing business.

He returned to veterinary school at Kansas State College in 1930, graduating with the class of 1933. Those were lean years in almost any section of the country, and the Midwest was hard hit, not only by economic depression, but by a dust bowl producing drought as well. It took bounding optimism and courage to combine a jobless graduation day with the role of a benedict. But the day after graduation, Dr. Clifford L. McGinnis married Miss Francis Jackson, a music major from the College of Emporia. "This was noteworthy," Doctor McGinnis recalled over 25 years later, "because four of my college roommates arrived at the wedding . . . " Their condition indicated that they had violated the laws of the then-dry state of Kansas.

Doctor McGinnis and his bride moved to Miami, Oklahoma where the couple came face to face with the pitfalls of opening a general practice. The country itself has since become famous in legend and song for its Grapes of Wrath character as well as for oil and millions. For Doctor McGinnis it was a three month lesson in economics. The gross receipts were $207. for the entire period. For the next several months he found more lucrative employment with Dr. Mark Morris, at the Raritan Animal Hospital at New Brunswick, N. J.

During 1934 he returned to Oklahoma to work on the federal state drought cattle-buying project. A year later he joined the staff of the North Shore Animal Hospital at Evanston, Ill. Three years later he moved to Peoria to pursue a general practice, and except for a



Dr. Clifford L. McGinnis

tour of army service Doctor McGinnis has been a practitioner ever since.

He served in New Guinea and the Philippines, spending 30 months overseas during World War II. He was discharged with the rank of major in 1945. While overseas both his practice and his hospital went up in smoke. Anyone with less of a flair for life might have become ruffled, but McGinnis remained cool and contained. He rebuilt his animal hospital, this time limiting his practice to pets.

A long-time member of the American Veterinary Medical Association and an active member in the American Animal Hospital Association, Doctor McGinnis is also a leading citizen in his community. He and his wife Francis are the parents of three children, Dirk, a junior at Bradley University; Alex, a freshman at Dartmouth; and Mike a high school freshman.

Dr. Reid B. England, KSC '46, is presently associated with him as a business partner.

The content and scope of Clinic will cover the small animal phase of a veterinarian's practice. Doctor McGinnis fits well into his role as the clinic's reporter. He has an understanding and insight into what makes a clinic tick. He is a scholar in his mind and a humorist at his fingertips but disclaims any ability as a research scientist. His reports will add something unique to veterinary literature.

The Army Mule
1775-1957

The last 136 army mules were sold from government service last month, bringing to an end a military record that dates back to the American Revolution.

With the passing of the mule also pass some of the army's most venerable landmarks—shoeing shops, dipping vats, stables, picket lines, corrals, and pastures. The animals sold at Fort Carson, Colo. were all that remained from the last two pack outfits—the 4th Field Artillery (Pack) and the 35th Quartermaster Pack Company. Seventy-seven orders were placed, in person and by mail. With a limit of three mules a person, 47 willing Rocky Mountain farmers and ranchers were successful. The army units themselves had been broken up December 15, 1956, and all men assigned to new outfits. The passing of the mule was not effected without the contrast of misty eyes set in the hardened faces of rough and ready field soldiers. As an inspiration to prose and poetry, the mule's demise leaves the service with the problem of finding a substitute for the simile, "tough as a government mule."

It was characteristic of the nation's oldest soldier to go out with a bang. The Associated Press reported chute rattling reluctance on the part of the animals to leave the military reservation. The 136 mules were sold for a total price of $3,320., with individual prices ranging from $10. to $40. per animal. Terms of the sales called for purchasers to move the mules off the post by 4 p.m., February 13, the hour and day that mark the end of an era.

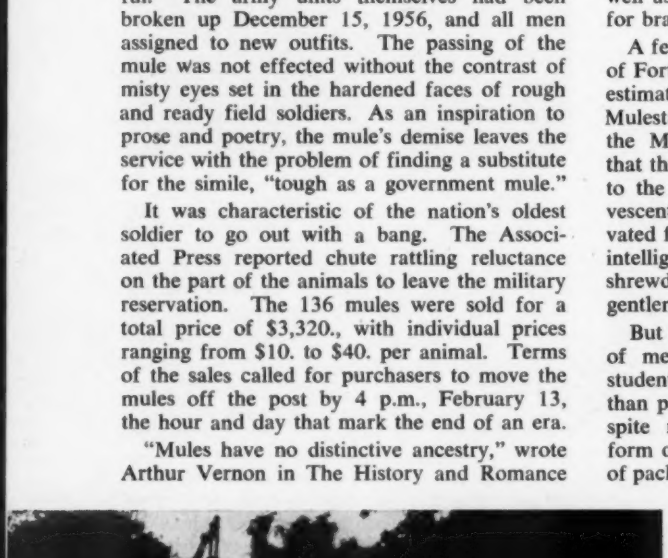
"Mules have no distinctive ancestry," wrote Arthur Vernon in The History and Romance of the Horse, "and no hope of progeny; but they have the courage of their convictions, the strength to think independently and the wisdom to be unhurried in decisions." Throughout the world distinctions have been placed on the mule's scapegrace head, even festivals have honored this animal of the well-aimed heel.

Mules in War and Peace

Victorious Italians home from Ethiopia honored the animal by erecting a monument to the mule in one of Rome's city parks. The Germans, famous for blitzkrieg warfare, nevertheless maintained almost 1,000,000 horses, and wherever the horses went, a full complement of mules brought up the supplies. Rabelisian mules in armies around the world have kicked generals and field marshals as well as privates, and have also been decorated for bravery above and beyond the call of duty.

A few months before Pearl Harbor, the town of Fort Smith, Ark. paid tribute to the nation's estimated 4,000,000 mules with the greatest Mulesta ever held. In 14 national magazines the Mulesta publicity man told the country that through manure the mule returned fertility to the soil, that unlike the tractor this effervescent fellow drew sustenance from the cultivated field, that the mule was faithful, friendly, intelligent, undaunted in spirit, in short, a shrewd and genial connoisseur of life, and a gentleman and a scholar to boot.

But sentiment can not hold back the tentacle of mechanization. Although a great many students of military history, civilian no less than professional, believe that future wars, despite mechanization, will require this early form of military transportation, the dissolution of pack units was accomplished with few words



Mules being led across a river that impeded progress in Burma during World War II. In the warfare characteristic of this area, horses and mules were vital; motor and air transportation almost useless.

of protest. The two arguments that might evoke reconsideration of the possibility of retaining the mule revolve around the possible character of operational terrain and the known character of the mule.

A mule is the offspring from the mating of a mare and jack. The hybrid resulting from the mating of a jennet and a stallion is called a hinny. The mule or hinny produces spermatozoa or ova with incompatible chromosomes. Without "pride of ancestry or hope of posterity," the mule is nevertheless a military asset. The animal is unsusceptible to many diseases of the horse, almost never overeats, lives longer, and endures under the most trying circumstances. During World War II the mule provided the stealthy supply lines required for jungle warfare in the South Pacific. British airmen narcotized mules with chloral hydrate and parachuted them to small detachments when landing aircraft was impossible. Mules that hit the silk at 600 feet were ready for action in 15 to 20 minutes.

World War II itself served up alarming lessons in the possibilities of horses and mules. Shortly before American forces were drawn into the hostilities, the U. S. Army scrapped the only veterinary company in the National Guard. France and England lost no time in sending its cavalry mounts and mules into the meat grinders at a time when Hitler was pressing into service close to 1,000,000 horsemen to be used in the lowlands, Poland, and France. Heavy panzer columns bogged down in Poland might have been annihilated by Polish infantry execpt for the fact that the Germans had correctly calculated on the use of cavalry. Similarly, it was the highly mobile Cossack horseman who made a bottle of gasoline with a lighted fuse—the Molotov cocktail—a household word by using it to burn out tanks.

Within a year after Pearl Harbor the American Army had more than doubled the equine population in the ground forces. It was blandly argued at the time that the casualty rate prohibited the use of horses, (the normal casualty rate for cavalry mounts is approximately 55% or higher), but no such argument was possible in the case of mules. By 1945 an army remount station in Italy had supplied 6,000 mules to the 5th Army, many of them procured in Italy and Sicily, and suffered less than 17% casualties. In the mountain fight around Casino and throughout the pennicular campaign, the only complaint about mules was that there were not enough of them.

From an economic point of view, it has been estimated that the substitution of mechanized equipment for animals is tantamount to incurring equipment costs for yearly replacements ten times higher than the cost of animal replacements. Helicopters to take the place of mules because of landing capability in mountain country would cost even more, aside from other disadvantages.

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Leptospirosis — Interprofessional Symposium

Increasing morbidity of leptospirosis, in both man and animals, has aroused leaders of medical and veterinary groups, and has stimulated cooperation of interprofessional groups in Kansas City, Mo. to present a one-day symposium on leptospirosis.

Presented jointly by the Kansas City Veterinary Medical Association, Department of Health, Education, and Welfare, Public Health Service, and the University of Kansas School of Medicine, this symposium will feature national authorities from among those groups most concerned with the disease.

It has been pointed out that on a world basis 34 distinct pathogenic serotypes of Leptospira have been identified, while in America no less than eight are of public health and veterinary significance.

All aspects of the disease will be presented, including its historical importance, microbiology, epidemiology, military aspects, pathology in man and animals, laboratory diagnosis, immunology and prophylaxis, and treatment. A panel discussion in which all faculty members will particpiate is scheduled for the final hour which will provide an opportunity for visitors to request comments on specific local problems.

The Interprofessional Symposium on Leptospirosis will be held at the University of Kansas Medical Center, Battenfield Auditorium (Continuation Center—Student Union Building) Rainbow at Olathe Blvd., Kansas City, Kans. on April 25, 1957. Registration will begin at 8 a.m.

Address all communication and request for programs to: Department of Postgraduate Medical Education, University of Kansas, School of Medicine, Kansas City 12, Kans.

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Mammitis in Sows

When treating sows for mammitis or agalactia, it is recommended that the baby pigs be treated by intraperitoneal injections of 5% glucose solution which will support blood sugar levels until the sow's lactation is restored. Hypoglycemia develop rapidly in starving newborn pigs.—*E. O. Haelterman, D.V.M.*

PRINCIPLES OF ANIMAL HEALTH

R. R. DYKSTRA, D.V.M.

Manhattan, Kansas

Leptospirosis a Growing Problem

Leptospirosis of both man and animals is presenting a difficult control problem. Familiarity with the condition and therefore greater accuracy in diagnosis is at least partially responsible for its more frequent detection by physicians and veterinarians. The disease is sometimes difficult to distinguish clinically in animals from acute respiratory ailments, brucellosis, and others. Physicians find clinical resemblances between leptospirosis, brucellosis, hepatitis, and even nonparalytic poliomyelitis. Since the specific organism (*Leptospira pomona)* is shed in the urine and in the milk, there is a means of dissemination of infection by outwardly recovered cases (carriers) as well as by those affected acutely. There probably are other means of spread such as close contact. No definite method of control has been offered because opinion has been expressed that the disease is selflimiting. Evidence of its existence may disappear in the course of several months. Quarantine of an infected herd has been suggested, but not imposed, because of the uncertainties in connection with the ailment. Dogs and rats are generally considered sources of infection and therefore their control or elimination is advisable. If veterinarians have knowledge of infected or previously infected animals in a herd, and if some of these are to be offered for sale, health certificates ought not be issued until bacteriological tests demonstrate lack of infection. Also human beings should be warned of the danger of close association with the infected and their excreta.

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Leptospirosis Transmissible

We are informed by a friend that he contracted leptospirosis, presumably becoming infected from a sow he attended during farrowing. As veterinarians well know, leptospirosis infection of swine may be present in the absence of symptoms. In some respects, this is a contradistinction from the usually visible clinical indications in cattle. Veterinarians have learned that in assisting animals, especially sows, during delivery, that hands and arms should be glove-protected.

Epitheliogenesis Imperfecti

A short time ago in a conference with a veterinarian we were told of the death of two calves shortly after their birth. The symptoms observed in both animals were an almost continuous drooling of sticky saliva, unthriftiness, and hairlessness of the regions below the carpus and tarsus. After a search through available literature in regard to lethal and sublethal hereditary traits we made a diagnosis of epitheliogenesis imperfecti—"skinless" is a lay designation — which is reported as "bilateral lesions most common below knees and hocks and on the muzzle, ears, and mucous membranes." The condition has been reported in Holstein, Ayrshire, and Jersey cattle. Advice to the owner in this case was to avoid the same dam-sire relationship as that which resulted in the defective calves.

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Dyed Chicks for Easter

With the approach of the Easter season there will again be interest in the dyeing of baby chicks. Various methods have been tried with limited success as follows: (1) Include a liberal amount of a fat soluble dye or a dye having an affinity for fat in the ration of laying hens. This will quite intensely color the egg yolk, and later chicks hatched from these eggs will have their fatty tissues and down colored. (2) Injecting a vegetable dye — green appears to be best — directly into the egg albumen of the unincubated egg; best results take place in chicks with white or very light colored down. (3) The direct method consists in dipping the chick—the younger the better—in a pure aniline dye solution. (Some persons use a "diamond" dye but a drying agent sometimes included is poisonous if swallowed). The temperature of the dye solution should be between 90 to 100 F. After dipping, dry chicks on a wire rack at a temperature of 100 F. Do not place on cloth as it will absorb much of the dye.

Editor: *City ordinances in some metropolitan areas prohibit the sale of dyed chicks or ducklings.*

VETERINARY PARASITOLOGY

A. O. FOSTER, B.A., M.A., Sc.D.

Beltsville, Maryland

Cattle Grubs, Systemics, and Phenothiazine

This note is prompted by two current events: (1) The issuance by the USDA of an A.R.S. Special Report on Cattle-Grub Control with Systemic Insecticides,[5] which contains informative discussions of progress with two organic phosphorus compounds commonly designated as Dow ET-57 and Bayer 21/199, and (2) the publication by a leading veterinary journal of a topical summary of Problems in Parasitology.[6] This summary was, in fact, a night letter prepared by the present writer and his associate, Dr. F. D. Enzie, in reply to a telegram asking, "What are the most important problems facing the profession in 1957?" Notwithstanding the fact that the reply was literally composed on a bowling alley, 19 problems were cited, three of which were as follows: (a) Dow ET-57, Bayer 21/199, and other systemics for cattle grubs and bloodsucking parasites, (b) optimum physical properties of phenothiazine, and (c) low-level and free-choice phenothiazine in cattle. It may be possible at a later time to develop briefly the other 16 topics.

Systemic Chemicals

Although recently associated, cattle grubs and phenothiazine are now discrete subjects. The erstwhile hopes of a systemic effect of phenothiazine on the migrating larvae of heel flies do not seem to have been bolstered by the results of extensive experimentation during the past year. Nevertheless, the question of systemic chemicals against cattle grubs and that of phenothiazine against helminthic parasites are both of prominent concern to the livestock industry, as well as to research workers and practitioners.

The story of Dow ET-57[7] is better known than told. Rarely, if ever, have veterinarians and parasitologists been so conversant on a subject of which so little has been reported in the usual technical journals. The absence of full, scientific reports on any of the intensive investigations that have been pursued during the past two years is an evidence of a general and laudable desire to avoid the danger of premature field use of the chemical. Nevertheless, it has been evident to the writer that highly varying opinions on the promise and potentialities of the chemical have resulted from the scattered releases, symposia, trade journal articles, reports at scientific meetings, and discussions among individuals. The A.R.S. Report, therefore, seems to be a timely account that goes a long way toward "clearing the atmosphere." The report emphasizes, moreover, that "ET-57 shows promise" and the results with it "should not be construed as proving that a new method of controlling cattle grubs has been found." It may be added that the compound has exhibited some disadvantages as a cattle grub treatment, but that it has been found also to possess action against certain parasites other than cattle grubs.

Bayer 21/199,[8] also a so-called phosphorus insecticide, is of special interest because it appears to effect systemic destruction of the migrating heel fly larvae when applied to cattle as a spray — a method of application that has advantages for treatment of range animals. Unfortunately, data on this material are more limited than on Dow ET-57; the chemical, moreover, has already been cited on this page[9] for its direct killing action on grubs when applied as a spray.

Phenothiazine

Regarding physical aspects of phenothiazine and low-level use in cattle, there is little to add to comments already made on this page,[10,11,12] despite the fact that there has been much "water over the dam" since those notes were prepared. The California studies on particle size and anthelmintic efficiency, now published,[13] favor a product having a mean particle diameter of 1 to 2 microns. At the same dosage (25 grams) such a preparation was adjudged to be 95% effective against Ostertagia and Trichostrongylus in sheep as compared with 70% efficiency of a commercial product having a mean particle diameter of 40 to 50 microns. It appears altogether evident, despite many unsolved problems, that there is a positive correlation between surface area of phenothiazine particles and efficiency against some species of nematodes. It further appears

that most, if not all, of the commercial N.F. product now available is of a particle size smaller than that of the commercial product used by the California workers. In their words, however, a "great deal of experimental work is required before the optimum phenothiazine preparation can be characterized,"* (*loc. cit.*, page 322).

Regarding phenothiazine for cattle, especially its low-level administration, a few reports have cast doubt on the economic advantages of the medication. Full data on these experiences are not at hand, but they are interpreted as discrediting the use of the drug in cattle. Unfortunately, the virtues of phenothiazine have lulled us into a position of false security. The drug does not remove or control all worms and is therapeutically ineffective in animals whose digestive function is seriously impaired. It is little wonder that there is concern over practical failures when one considers the wide and almost exclusive reliance on phenothiazine as a panacea for gastrointestinal parasitism. In short, small doses, 2 to 4 gm. per head daily, have been shown to achieve a good effect against at least three common kinds of parasites in cattle — Haemonchus, Bunostomum, and Oesophagostomum.

Parasite Hazards

If these parasites are not a hazard in a particular flock, there may be little to be gained by employing free-choice or low-level phenothiazine. If they are a hazard, the principal problem, as defined a decade ago, is the employment of a formulation or technic that will assure adequate and regular intake of the chemical. This is about all that can be said without further recapitulation of facts that are available to all. It should be admitted, however, that this problem may not be entirely independent of the aforementioned one of particle size, since no one has yet shown that products of small particle size, toward which commercial products are now moving, are more efficient than products formerly used for destroying parasite eggs and larvae in the feces and on pasture. In therapeutic use, moreover, we do not yet know what efficiency the newer products have against important nematodes in the large bowel of cattle, sheep, swine, goats, and horses, or in the ceca of chickens and turkeys. But these are only some of the many problems that the current trend in particulation has precipitated. We are destined to learn much more about the aforementioned subjects in the months ahead.

*Note: *Gordon's work on particle size (Aust. Vet. Jour. 10:258-268, Oct., 1956) came to attention after this note went to press. It is illuminating but leaves many questions unanswered. Nevertheless, it appears that the efficacy of N. F. phenothiazines would probably be enhanced by finer particulation. Although the optimum particle size is not determined, any portion of a product that represents particle sizes larger than 40 microns presumably contributes little to anthelmintic efficacy. Desirably, therefore, 100% of the particles in an optimum product should be smaller than 40 microns. Apparently, it is desirable also that 80-90% be of particles smaller than 15 microns, and that the average for the product be in the vicinity of 5 microns or less.*

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Filariasis of Dogs in the United States

Although different species of filarial worms are known to infect dogs, the finding of microfilariae in the blood of dogs in this country has been generally regarded as indicative of infection with heartworms, *Dirofilaria immitis*. A study by Newton and Wright,[1] who took a careful look at their material, has revealed the occurrence of another dog filariid, which is presumably a species of *Dipetalonema*, possibly *D. reconditum*. This is a tissue-inhabiting species and probably develops in fleas, whereas mosquitoes are the uncontroverted intermediate hosts of the heartworm.

The finding of two species that use different intermediate hosts and live in different parts of the body resolve many problems, such as conflicting reports on vectors of "heartworms," the frequent absence of heartworms in dogs that have microfilariae in their blood, and varying experiences with chemotherapeutic and diagnostic methods.

Significantly, study has shown that the two types of microfilariae differ sufficiently in gross morphology and internal anatomy to permit their differential diagnosis.

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[1]Newton, Walter L., and Wright, Willard H., *Jour. Parasitol.*, 42:246, 1956.

[5]USDA, A.R.S. Special Report, 22-37, 8 pp., Jan., 1957.

[6]*N. Am. Vet.*, 38:21-A, Jan., 1957.

[7]Code designation of O,O-dimethyl 0-2,4,5,- trichlorophenyl phosphorothioate.

[8]Code designation of 3-chloro-4-methylumbelliferone O,O-diethylthiophosphate.

[9]*Vet. Med.*, 50:149, Mar., 1955.

[10]*Ibid.*, 50:427, Sept., 1955.

[11]*Ibid.*, 50:90, Feb., 1955.

[12]*Ibid.*, 48:208, May, 1953.

[13]Douglas, James, R., *et al.*, *Am. Jour. Vet. Res.*, 17:318 (Apr.), 1956.

PUBLIC HEALTH

JAMES H. STEELE, D.V.M., M.P.H.
Atlanta, Georgia

NOTE: *The following is prepared in connection with World Health Day, April 7, to provide information on the international activities of the World Health Organization and the benefits being accrued for everyone.*

International Human Disease Control

The World Health Organization, in a special report on International Sanitary Regulations, states that in the years since the end of the World War II, there has been a dramatic decline in the extent and severity of the so-called "quarantinable diseases" — cholera (*Vibrio comma*), plague (*Pasteurella pestis*), typhus (*Rickettsia prowazekii*), relapsing fever (*Borrelia recurrentis*), smallpox, and yellow fever. These diseases are now shadows of their former menace. It is against these diseases that quarantine measures were adopted during the last five centuries. In years past numerous sanitary conventions had grown up in different parts of the world which were often in conflict. To eliminate these hindrances to commerce the WHO developed International Sanitary Regulations which could protect the public health but also allow people and goods to move freely. The new regulations went into effect in October 1952 and replaced all earlier sanitary conventions. Since the new regulations have been in effect only 45 ships and one aircraft have been reported as infected, *i.e.* carrying a person suspected of suffering from one of the quarantinable diseases. Not only have these regulations proved satisfactory but they are being enforced in a way which indicates a mutual feeling for cooperation, understanding, and goodwill. International accord now prevails in a domain which was traditionally one of controversy.

The WHO Chronicle[1] has reviewed the recent history of the five quarantinable diseases and points up the dramatic decline of these diseases throughout the world.

Cholera

Cholera has been endemic for centuries in India and China, but until the 19th century there were no pandemics. During that 100-year period there were six pandemic waves which reached nearly all parts of the world including the United States. The last epidemic reached the United States in 1873. An investigation of this one by the U. S. Marine Hospital Service, formerly the name of the U. S. Public Health Service, was the basis of the maritime quarantine regulations to prevent importation of disease. Since the 1920's cholera has declined in all parts of the world except India and Pakistan. Following World War II it appeared in Japan in 1946, Egypt and Syria in 1947 and Indochina 1947-1952. During the 1950-1954 period cholera deaths in India and Pakistan totaled 385,000 compared to 824,000 during 1945-50, which is the lowest on record.

The declining importance of cholera throughout the world may be attributed to better sanitary conditions in most areas of the world which makes it difficult for disease to spread.

Plague

Plague is described as the worst calamity that ever befell mankind. The first record of a plague pandemic dates from the 6th century A.D. In the 14th and 15th centuries it was the cause of the notorious "Black Death" which killed millions of people in Europe and Asia and almost destroyed organized society. As late as the 18th century epidemics were reported in Sweden and Russia. The last pandemic appeared in China in the late 19th century and spread to all parts of the world *via* maritime traffic. The first appearance of plague in the United States occurred in the 20th century and is considered a remnant of the China pandemic. The disease in the United States is found only in the far western states and has been found in ground squirrels and rabbits as far east as New Mexico and Colorado. The disease has declined in man throughout the world although it is frequently found in rodents. General sanitary improvement has contributed to this situation, along with new insecticides and rodenticides. The WHO authorities state, "It must be remembered, however, that plague is essentially an animal infection, occasionally 'spilling over' to humans. The problems of wild rodent plague in certain countries remains as important as

ever." If civilization should be badly disrupted, there is doubt that plague would again add to the misery and suffering of mankind. Plague is by far the most important of the zoonoses.

Because of the control of rodents on ships and at ports there is little opportunity for plague to spread internationally *via* maritime shipping.

Epidemic Typhus

Epidemic typhus is undoubtedly one of the oldest pestilential diseases of mankind. It has been the grim companion of war, famine, and catastrophe. Frequently it was the decisive factor in war or invasion. It was expected to be a major problem during World War II, but actually never got out of control although there were serious outbreaks in North Africa, Yugoslovia, and Korea. Today typhus has disappeared in many parts of Europe and Africa, except for Ethiopia where a large number of cases have been reported since 1950. The incidence of the disease has dropped rapidly in Latin America since 1953. During the vast immigration to North America in the 19th century typhus fever was seen occasionally among immigrants. It never reached epidemic proportions or spread to any extent in the United States. There is little likelihood of the spread of typhus by international travel today.

Relapsing Fever

Louse-borne relapsing fever is the least known of the quarantinable diseases. Never a serious problem in international travel, it is now on the decline everywhere. Europe has been free of this disease since 1949. Outbreaks have occurred in Cambodia (4,261 cases in 1950), Korea (2,738 cases in 1951, only 25 in 1953), and Ethiopia (1953, 54, and 55). The only epidemics in the United States occurred in Philadelphia and New York in 1869. Louise-borne relapsing fever is unknown in the United States today. A tick-borne relapsing fever is found in western North America and causes sporadic cases in man. The tick-borne disease maintains a reservoir among wild rodents.

Smallpox

Smallpox is another of the great scourges of mankind that can survive under any conditions where there are susceptible human beings. All epochs, regions, climates, and people have known smallpox. In Europe where its ravages were slight, compared to Asia, Africa, and the Americas among the natives, it killed hundreds of thousands yearly and depopulated cities. Since the discovery that cowpox can protect man against smallpox, the disease has declined. The last major epidemic in the United States was in 1924, when 74,000 cases and 1,270 deaths were reported. Sporadic cases have been seen in parts of the United States up to 1952. Since then no confirmed cases have been reported. During the five years 1951-1955, 178,000 cases were reported compared to 193,000 in the 1946-50 period. More than 80% of these occurred in Asia, 14% in Africa and 5% in Latin America. The fact that the severe type of smallpox is now confined to certain endemic areas of the world is evidence of its dramatic decrease. The persistence of these endemic foci requires constant vigilance to prevent its spread. An example of recent spread of smallpox is its introduction into France by a soldier returning from Indochina early in 1955. Some 30 cases were reported following the diagnosis in the soldier. Among these cases were seven physicians, two interns, and five hospital attendants. One of the physicians died of the disease although he had been vaccinated in 1942 and revaccinated a month before he died in January 1955.

Smallpox is the only disease for which a citizen of the United States going abroad must be vaccinated to re-enter the States; this applies also to non-residents of the United States, *e.g.* visitors, immigrants, et cetera. A citizen going abroad must have an immunization certificate stating that he has been successfully immunized against the disease within the last three years.

Yellow Fever

Yellow fever is a tropical disease of Central Africa which was carried to the Americas, Europe, and North Africa by infected slaves. Strangely it has never spread to Asia although there has always been thriving trade between Africa and Asia. This is an epidemiological enigma which influences quarantine practices between those areas.

Yellow fever was a major epidemiological problem in the United States during the 19th century. Outbreaks occurred in New York, Philadelphia, Baltimore, New Orleans, the Mississippi and Ohio River Valley communities. The last epidemic was in New Orleans in 1905. Since the demonstration by Walter Reed in Havana 50 years ago that yellow fever could be eradicated in urban areas by *Aedes aegypti* control, the infection has been brought under control in all the urban areas of the Americas.

Today a new form of the disease, sylvatic yellow fever has appeared in monkeys in the

jungles of South and Central America, and Africa. This has caused quarantine authorities to consider the possibility of the introduction of yellow fever as an animal disease. Precautions have been instituted to prevent the importation of infected monkeys. These require all monkeys to be examined on entry into the United States and where indicated vaccinated against yellow fever and detained. Travelers who are going to countries where yellow fever is prevalent are urged to receive yellow fever vaccine.

The WHO points out that thanks to mosquito, *A. aegypti,* control and yellow fever vaccine the disease does not constitute the threat to to international health that it did 50 years ago.

Conclusions

The WHO optimistic with regard to the elimination of these age-old threats to human health but one must be cautious as to the diseases that continue their existence in lower animals. Plague, relapsing fever, and yellow fever have animal reservoirs and can be described as zoonoses. There is little likelihood that they can be eradicated but those diseases which only survive in man are more susceptible to eradication measures. Smallpox and cholera have no animal reservoirs. The same can probably be said for epidemic or louseborne typhus although some investigators suspect that there may be an animal reservoir somewhere in nature. As the major human communicable diseases decline the zoonoses assume greater significance in the public health field.

REFERENCES

1. World Health Organization Chronicle, Vol. 10, No. 9-10, Sept.-Oct. 1956.

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Animal Health Services (Great Britain) reported nine outbreaks of foot-and-mouth disease in Great Britain during calender year 1955 (*The Veterinary Record,* Jan. 26, 1957). Seven of these were considered primary, and six were believed to have originated from imported meat and meat wrappers. Viruses concerned were types C and O. Incidence was noted to be lowest since 1918.

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Government inspectors seized more than 38 tons of prohibited and restricted meats from airplanes and ocean vessels during 1956 to prevent introduction of disease. Some 5,500 lb. of such meats were seized from postal and express packages from abroad.

Studies Provide Male Fertility Index

Scientists from Southwest Foundation for Research and Education have announced a new index for male fertility. In a paper published in the *Journal of the American Society for the Study of Fertility,* Drs. Frederick M. Haag and N. T. Werthessen reported on studies which have been made with Thoroughbred horses.

The index is the sulfhydryl content of the seminal fluid. When a large quantity is present, there is a reduction in the capacity of the sperm to maintain its ability to move. This is associated with a reduced chance of pregnancy. The range of the sulfhydryl concentration varies from day to day.

The study was made at the San Antonio institution's branch at Lexington, Ky. and some of the top names in racing participated in the program. The work was supported by the Keeneland Foundation, the Grayson Foundation, the Greentree Stud, Inc., and the World Population Council.

Breeders naturally want to increase the chance of pregnancy resulting. However, they can not wait until natural processes indicate the mare is pregnant. If a mare is to be rescheduled, it must be done within the short time she remains in the heat period.

There is an additional time factor involved. Breeders want the foals dropped as early in the year as possible. No matter when they are born during the year, they automatically become one year old the following January first. If an adequate field test can be developed, the mare can be rescheduled within a short time if it is indicated that the chances for pregnancy resulting are low.

The study revealed that there was an inverse correlation between the sulfhydryl content and pregnancies. The ratio was as follows:

Sulfhydryl Value	% Pregnancies
0-3	56.6
4-6	32.1
Plus 6	4.3

Haag is in the process of developing a simple field test procedure which can be used by the farm manager or veterinarian on breeding farms. This will mean that by testing a sample of the semen, odds for pregnancy resulting can be determined. If they are low, the mare can be rescheduled within the next few days.

▼ ▼ ▼

A cattle brucellosis-free nation by 1960 is the goal of the National Brucellosis Committee.

THE PRACTITIONER'S LABORATORY

WILLIAM L. SIPPEL, B.S., V.M.D., M.S., Ph.D.

Kissimmee, Florida

Blood Urea Nitrogen Test

Bentinck-Smith *et al.*[1] have described a modification of Caraway's xanthydrol technic for urea nitrogen that is well adapted to the veterinarians' office laboratory.

Clinicians will find the test useful as a diagnostic aid in leptospirosis, uremia-toxemia of baby pigs, or in urinary retention; as for example, from urethral calculus. In man, whose normal blood urea levels are similar to those of animals, patients with a level above 35 mg. are considered poor operative risks.

The method is semiquantitative. Test may be completed in ten minutes with 0.2 ml. of serum or plasma. Procedure is based on reactions of xanthydrol with urea to form dixanthylurea, which in the case of above-normal levels of urea imparts distinct turbidity to the solution. The degree of turbidity in the reaction tube is the end-point of the test.

In their carefully controlled work Bentinck-Smith *et al.*[1] found no interference with the test by hemoglobin in hemolyzed samples, bilirubin in icteric animals, albumin, barbiturates, or digitoxin. Ordinary blood concentrations of sulfonamides did not interfere, however when sulfathiazole at a concentration of 40 mg. per ml. of a 4% bovine albumin solution was tested, turbidity did result. Lesser concentrations did not interfere. Severe lipemia in a dog with diabetes interfered with the test. Whole blood can not be used for the test due to protein precipitation and interference of the hemoglobin.

Reagents and Equipment (Fig. 1)

Only two easily prepared reagents are required:

(1) 50% acetic acid. Equal amounts of glacial acetic acid and distilled water. (Tap water may be substituted but possibly will produce transient bubbles at step 4 of the procedure.)

(2) 5% xanthydrol (Eastman)* in absolute methyl alcohol. Dissolve 5 gm. xanthydrol in 100 ml. of absolute methyl alcohol and store in refrigerator in a dark bottle. Filter if cloudy. The reagent is a stable for three months.

Equipment:

(1) One (or more) clear test tube about the size of a "Bangs" tube (approximately 100 x 12.5 mm.).

(2) Delivery pipette, (4 ml.) (a 5 cc. syringe may be substituted).

(3) Serological (blow out) pipette (1 ml.) graduated in tenths, (a 1 cc. tuberculin syringe may be substituted).

(4) Serological pipette (2 ml.). The "Bangs antigen" pipette delivers this amount.

(5) Cork stopper for test tube.

Procedure

(1) Place 0.2 ml. of plasma or serum in the tube.

(2) Add 4 ml. of 50% acetic acid.

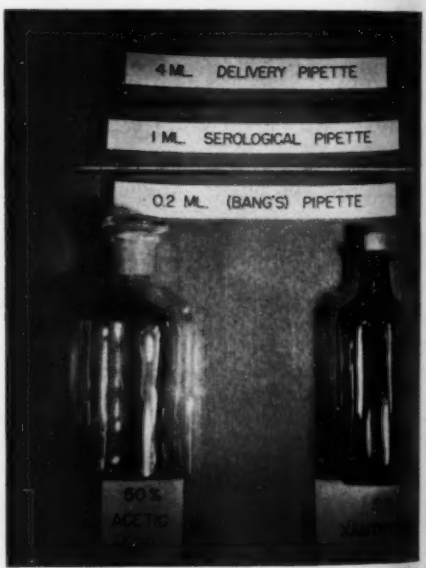

Fig. 1. Reagents and equipment used in urea nitrogen test; 5 ml. and 1 ml. (glass tuberculin) syringes can be substituted for the two larger pipettes.

*Reagents available from Hartman-Leddon Co., 5821 Market St., Philadelphia 39, Pa.

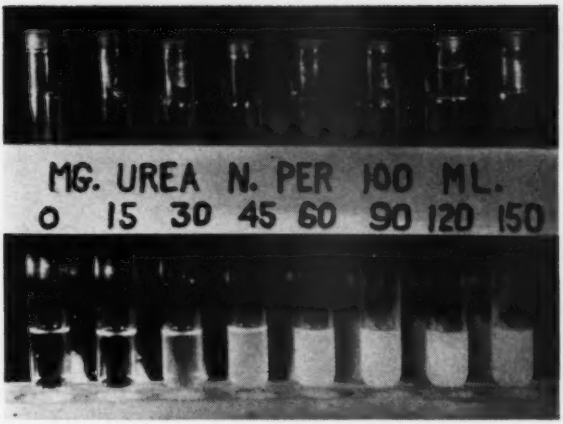

Fig. 2. Appearance of urea nitrogen test standards at 5 minutes.

(3) Add rapidly 0.4 ml. of 5% xanthydrol reagent.

(4) Stopper immediately and invert twice.

(5) Note time and make readings at exactly one and five minutes.

If syringes are used instead of pipettes in steps 2 and 3 be sure all air is expelled from syringe and needle before adding the measured amount of reagent.

Interpretation

Normal values for blood urea in domestic animals lie below 30 mg. per 100 ml. of serum or plasma.[2] In controlled tests with measured amounts of diluted urea (fig. 2) faint turbidity was observed at levels of 30 mg. per ml. Thus the development of definite turbidity in the reaction tube would indicate abnormally high amounts of urea nitrogen. As a rule of thumb, Bentinck Smith *et al.*[1] used the visibility of typewriter letters through the solution as a criterion. At levels of 40 mg. or higher type was either barely visible or invisible, at the five minute reading. At the one minute reading the 40 mg. tube was clear. The 40 mg. level should probably be considered as the lower limit of the "above normal" range.

Monlux[3] noted a fluctuation in the urea nitrogen proportional to the amount of protein (meat) in the diet of experimental dogs. He found blood urea levels elevated for 1½ weeks and again at three weeks after experimental infection with Leptospira.

In baby pigs with the uremia-toxemia syndrome, autopsied in our laboratory, levels have been 60 mg. or higher. Some of these were confirmed by the presence of macroscopically visible white or orange deposits of urates in the pelves of the kidneys.

REFERENCES

1. Bentinck-Smith, John, Hyde, John L., and Barr, Louise M., A Simple Technique for Urea Nitrogen: The Xanthydrol Reaction Evaluated. *Cornell Vet.*, 46:129, 1956.

2. Dukes, H. H., The Physiology of Domestic Animals, 7th ed. 1955. Ithaca, N. Y., Comstock Publishing Associates.

3. Monlux, W. S., Leptospirosis III. The Clinical Pathology of Canine Leptospirosis. *Cornell Vet.*, 38:109, 1948.

▼ ▼ ▼

Test Insects for Insecticide Poisoning

Insects will serve for the biological test for insecticides described by Dr. W. L. Sippel (*Vet. Med.*, 53:152 [Mar.], 1957) during periods when house or stable flies are not abundant.

▼ ▼ ▼

Antibiotic Treatment to Increase Shelf-Life of Poultry

The Federal Food and Drug Administration late in 1955 issued permission for the use of chlortetracycline in the dressing of poultry. The order states, "A tolerance of seven parts per million is established for residues of chlortetracycline in or on uncooked poultry and this tolerance level should not be exceeded in any part of the poultry." By this means the store-life of the poultry carcass is extended from approximately seven days to as much as 14 to 21 days. It is reported that when breast muscle is immersed in a 1:1000 solution of chlortetracycline so that it absorbed up to 130 parts per million of the antibiotic it is all inactivated after an hour of boiling or roasting. It is claimed that there is no chance that the consumer of the meat will receive any active antibiotic.

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Twenty-five words or less, $3.50—minimum charge; additional words, 10 cents each. Replies sent care VETERINARY MEDICINE. 50 cents additional to cover forwarding postage. Remittance must accompany order.

Names of classified advertisers using V. M. key numbers cannot be supplied. Address your inquiry to key number, care VETERINARY MEDICINE, Suite 803, Livestock Exchange Building, Kansas City 2, Missouri, and it will be promptly forwarded to the advertiser.

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X-RAY UNIT: Like new, excellent condition. PROFEXRAY mobile unit. Ideal for veterinary practice and available at fraction of original cost. Address Box 347, care VETERINARY MEDICINE.

Research Reveals Highly Effective Anthelmintic for Cattle

The results of recently intensive clinical research revealed an anthelmintic that is highly effective in killing intestinal parasites in cattle. Individual animals were confined in special stalls and administered different phenothiazine drench formulations for testing. All urinary and fecal excreta were recovered and each excretion was individually analyzed chemically to detemine how much of the dose went into the digestive tract and amount of the dose available for killing worms. Dosages were given on an identical basis.

GREATER CONCENTRATION

Results obtained from this modified formulation were better than that of unmodified drenches generally used. Tests show that modified formulations produced on the average 6 to 8 times more phenothiazine in the digestive tract in a shorter period of time than other drenches. For example, peak percentages (above 1%) of the modified chemical were obtained in only 17 hours post treatment while the average of unmodified formulations returned a peak percentage of less than .2% 40 hours or later post treatment.

All statements regarding the effectiveness of the above tests are backed by documented experimental data.

Many veterinarians are using this modified formula under the professional label Pro-Brand Improved Cattle Wormer which is sold only to veterinarians. Pro-Brand is produced by Pro-Brand Products Company, a subsidiary of Texas Phenothiazine Company. For details write to Pro-Brand Products Company, P. O. Box 4186, Fort Worth, Texas.

▼ ▼ ▼

High Roughage for Calves

Experimental work to determine practical feeding methods for calves has been pursued by scientists at the Ohio Experiment Station for several years. These studies are continuing. Confirmation appears assured of advisability of providing a high roughage diet early, and also encouraging rumen function by cud inoculation weekly for five weeks beginning when the calf is two weeks of age.

The system which is resulting in growthy early maturing heifers involves limited milk feeding to seven weeks of age, free choice feeding of good quality, mostly legume hay, after three days of age, and the use of a simple grain mixture limited to about one-half the amount of hay consumed.

▼ ▼ ▼

Indicated are that the turkey crop for 1957 may be 84,000,000 birds, an increase of 10% over last year, according to grower's intention on January 1. If this number of birds moves to market, prices will probably be substantially lower than in 1956.—*Feedstuffs, 1/26/57.*

Veterinary Student Enrollment

Enrollment in veterinary schools and college for the school year 1956-57 is tabulated, *Jour. Am. Vet. Med. Assn.*, 129:536 (Dec. 1), 1956.

Of particular interest is the percentage of first year students (freshmen) who have undergraduate degrees. Shortly after World War II the number of such students increased sharply. Competition for admittance to veterinary schools and the relatively small number of those seeking admission that were accepted was the reason given for this high scholarship record. With the establishment of more schools (now 17 in the United States and two in Canada) pressure for admittance has been somewhat reduced though acceptance rate (1:2.5) is practically the same as in most recent years, nevertheless 45% of those enrolled as first year students in the profession curriculum have college degrees. In numbers this is 218 or 942 in 17 United States schools, of which 207 have bachelor degrees and 11 have masters degrees.

Total enrollment for all schools in both this country and Canada is 3,958, only slightly changed from last year. Of these, 852 are classified as seniors scheduled to graduate this spring.

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Through motion pictures, member companies of Associated Veterinary Laboratories are telling America of the value of modern veterinary service. An estimated 22,000,000 people have already viewed the film "Valiant Years" — 21,000,000 by television, and 2,000,000 in group meetings. In addition, the film "Veterinary Medicine as a Career" has been shown to many thousands more, through civic clubs and similar bodies.

This is just another step in Associated Veterinary Laboratories' 5-point program to educate the public to greater use of the veterinarians' services — through newspapers, farm magazines, radio, television, and motion pictures.

This project on behalf of the profession is made possible by the ethical companies whose names are listed on the opposite page. It will be appreciated if you will remember them when you place your orders.

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Collection of Soil Samples Throughout World Could Lead to More Potent Antibiotics

The earth itself, in combination with man's scientific skill and intensive research, has yielded numerous medical remedies for the ills of its inhabitants.

Neither the entire storehouse of the earth's mysteries, nor the list of confounding illnesses which have plagued mankind for generations has been exhausted, however.

Collection of soil samples to determine their scientific usefulness is just one phase of the vast research programs conducted by the larger ethical pharmaceutical companies.

At Parke, Davis & Company, the soil collection program is conducted by the Antibiotics and Mycology section of one of the six major departments in the Research division.

The program was streamlined recently by Dr. John Ehrlich, laboratory director in antibiotic research, and his associate, Dr. Arthur D. Hillegas, to include hundreds of the company's sales representatives spotted throughout the world.

The salesmen dig the samples from their areas and return them to the company's main laboratories in Detroit for testing.

Through an involved and lengthy process which includes two incubating periods and two phases of agitation on a shaking machine, researchers isolate cultures of microorganisms from each sample preparatory to numerous tests determining the usefulness of each.

Doctor Ehrlich said the new soil collection plan replaces a similar method used for the past decade. Under the old plan, individuals in this and foreign countries collected soils for the company.

Under the new plan, each Parke-Davis salesman — in addition to his usual briefcase — now carries plastic containers he fills with soil. Small plastic bags are sent to those in overseas areas (to lessen the possibility of crushing and because, when filled, they occupy less space), while those in the U. S. and Canada receive plastic tubes. Samples are collected from any spot in the individual's area — a backyard, a meadow, a field — although the company sometimes sends out requests to different sections of the world for samples from specific areas such as "the grassy areas of the eastern hemisphere."

(Continued on page XLI)

When a "synergistic effect is desirable, combined drug therapy should be used...."[1] Synergistic combinations are becoming increasingly desirable

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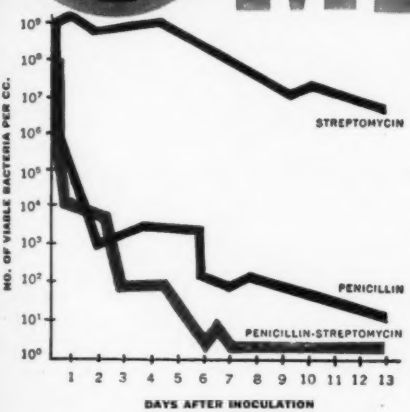

This graph presents the combined, synergistic antibacterial action of penicillin and streptomycin on a culture of *Streptococcus liquefaciens* (strain L. W.).[2]

1. Welch, H.: Antibiotic Med. & Clin. Therapy *3*:375 (Nov.) 1956. 2. Adapted from Hunter, T. H.: J.A.M.A. *144*:524 (Oct. 14) 1950.

"In general practice, experience and clinical judgement are the only leads to proper therapy, and it is in such situations that combined therapy using synergistic combinations of antibiotics will find its greatest usefulness."[1]

supplied:

COMBIOTIC P-S (DRY)
Single-dose vials and five-dose vials; each dose contains: 100,000 units penicillin G potassium, 300,000 units penicillin G procaine, and 1.0 Gm. dihydrostreptomycin.

COMBIOTIC AQUEOUS SUSPENSION
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METIMYD offers the assured Meti-steroid benefits of prednisolone acetate (0.5%), plus the wide range antibacterial action of sulfacetamide sodium (10%) and neomycin sulfate (0.25%).

Packaging: METIMYD Ointment, ⅛ oz. applicator tube, boxes of 1, 12, 36.

METICORTELONE,* brand of prednisolone.
METIMYD,* brand of prednisolone acetate and sulfacetamide sodium.
*T.M. V-MM-J-117

Schering

SCHERING CORPORATION, BLOOMFIELD, NEW JERSEY

(Continued from page XXXVIII)

There is no compensation for collecting samples, and the company encourages other employees to collect samples while on vacation.

The filled container, with a card pinpointing the exact spot where the sample was obtained, then is returned to the Detroit laboratory.

Some "collectors" have proved very descriptive in noting where particular samples were picked up. L. R. Schoenwellen, of the company's San Francisco branch, sent in one sample from the "fifth tee at the Washoe County Golf Course," Reno, Nevada. Another came from the flower garden of a Bermuda Hotel. And Mason Combs, from the firm's Cincinnati branch, mailed a sample "14 miles from Pineville, Kentucky, on the left fork of Straight Creek."

George Coffey, St. Clair Shores, Mich., associate research microbiologist for Parke-Davis, said the entire process — from the time a soil sample is received until the possible introduction of an antibiotic — may take "three or four years."

Upon receipt, Coffey explained, each container is numbered and tests begun to determine the number and types of organisms in the soil. Most soil contains three classes of microscopic plants — molds, bacteria, and actinomycetes — and from five to 20 kinds or species of each class.

Each species is isolated, grown in test tubes and tested against various bacteria to determine its ability to inhibit growth of particular types of bacteria. Less than a third prove active, and the most promising of these are processed further.

This includes identification (to make sure the "active" culture is not already known), and growth in large volume for chemical and biological investigation.

Before production, further laboratory and animal tests must be made. Up to one year or longer then is required for intensive studies to insure that the new antibiotic will not affect humans.

Marilyn DeKeyser, Grosse Pointe, Mich., keeps track of all incoming samples and outgoing containers. She said more than 7,000 samples have been returned since the new program was launched.

Some 1,300 Parke-Davis salesmen, plus hundreds of volunteer employees, are participating in the plan, considered highly essential in the company's continuing search for new and more effective disease killers.

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Vesicular Exanthema Under Control

No outbreaks of vesicular exanthema have been reported from California for more than a year. New law requiring cooking of garbage before feeding swine is the key factor in control of this vesicular disease and the experience in California substantiates this fact. Veterinarians there and elsewhere are alert for identification of outbreak and concerned for possible no gross lesion cases.

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Respiratory Diseases of Poultry

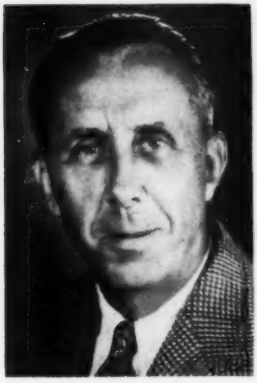
Diseases of poultry classified as "respiratory" which include Newcastle disease, air sac disease, infectious bronchitis, laryngotracheitis, coryza, chronic respiratory disease (CRD), and infectious sinitis are considered major menaces to the poultry industry, according to Dr. H. M. DeVolt, Maryland University pathologist.

Key to control is accurate diagnosis, which is impossible without clinical observation and approved laboratory procedure. Much of this work is being performed by veterinarians who have equipped themselves to render such service to poultrymen.

▼ ▼ ▼

During the banquet session of the Annual Conference for Veterinarians held at Colorado A. & M. College, Ft. Collins, in Mid-February, a plaque was presented to Mr. John Holtrof of Akron, Colo. as the stockman who had contributed most to the advancement of veterinary medicine and animal disease control in the state. Mr. Holtrof is co-chairman of the Floyd Cross Research Foundation.

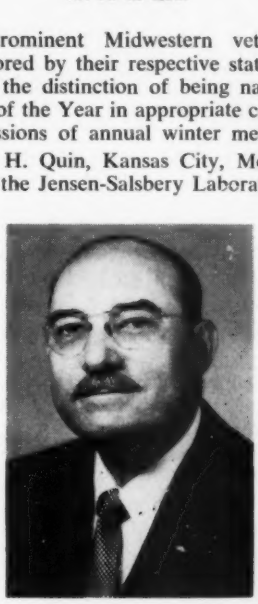
Veterinarian of the Year



Dr. A. H. Quin

Two prominent Midwestern veterinarians were honored by their respective state association with the distinction of being named Veterinarian of the Year in appropriate ceremonies during sessions of annual winter meetings.

Dr. A. H. Quin, Kansas City, Mo., associated with the Jensen-Salsbery Laboratories and



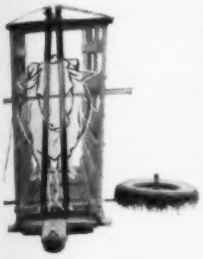
Dr. C. W. Bower

past-president of the A.V.M.A., was named by the Missouri Association, and Dr. C. W. Bower, Topeka, Kans., former president of both the A.V.M.A. and A.A.H.A., was named by the Kansas group.

▼ ▼ ▼

Mass vaccination of both cattle and swine with *L. pomona* bacterin is to be recommended to halt spread of leptospirosis in herds where infection is positively diagnosed.—*H. S. Bryan, D.V.M.*

GATELESS CATTLE CHUTE



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Testing - vaccinating
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Easy handling. approx. 600 lbs.

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Write: DIXIE CATTLE CHUTE
CONOVER, N. C.

A.V.M.A. Activities

In his address before the Missouri Veterinary Medical Association which convened at St. Louis on February 15, General Wayne O. Kester, president of the A.V.M.A. stated that 18,120 veterinarians are listed in the current directory of whom 53% are engaged in general practice. The remainder, 35%, are associated with the United States Department of Agriculture in various capacities, the U. S. Army, and U. S. Air Force, schools, research organizations, public health groups, commercial supply houses, and others unlisted.

Of those qualified for membership 70.5% are active whereas 29.5% are listed as "nonmembers." He indicated that this percentage distribution was applicable also to the situation in Missouri.

In reference to character of programs planned for state meetings, General Kester recommended consideration of advanced training technics to assure interest of the best scientifically trained groups.

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BRAND OF PREDNISOLONE
for adjustment to the
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which is a factor in
SEPTIC METRITIS
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University of Illinois scientists are encouraged by reported good results of feeding irradiated yeast to cows for one week prior to calving. Among animals in herds experiencing a high incidence of milk fever this preventive method appears promising.

Increased vitamin D intake influence toward increased blood calcium levels. Caution is advised that too large quantity fed overlong may be harmful.

Personalities contributing to the success of the 73rd annual convention of the New Jersey Veterinary Medical Association which convened at Asbury Park on February 13-14, 1957, posing before the winning exhibit at that meeting.

Pictured (l. to r.): Dr. E. L. Brower, Freehold, Exhibit Chairman; Dr. Robert Crelin, Neptune, retiring President; Dr. Harry Bartolett, Freehold, Dinner & Entertainment Chairman; and Dr. R. L. Ticehurst, Red Bank, Program Chairman.

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Dr. H. Lincoln Easterbrooks, formerly associated with the Connecticut Experiment Station, Storrs, and more recently employed on the technical staff of the American Cyanamid Co., has accepted a position as associate professor of veterinary medicine in the School of Veterinary Medicine, University of Pennsylvania, Philadelphia. Doctor Easterbrooks will direct research and diagnostic programs, in addition to teaching, at New Bolton Center, the 220 acre research facility of the school.

▾ ▾ ▾

Mesquite for Cattle

The Texas drought has forced cattlemen to take another look at some poorly thought of materials as sources of nutrients. To stay in business, many of them are now feeding all sorts of materials. Prickly-pear cactus is one which has been fairly popular in recent months.

Now, according to a *Wall Street Journal* report, a Mr. C. E. Doolin of Bigwells, Texas is grinding mesquite wood for use as a feed ingredient for his cattle.

The mesquite replaces the more conventional hays which are normally fed. Mr. Doolin feels that in his operation, the mesquite has a nutritive value roughly comparable to that of prairie hay and Johnson grass.

To prepare mesquite feed, the top limbs, which are more tender, are stacked for five days to "cure." They are then chipped, shredded and ground. Molasses, grain, and cottonseed meal are added to make a balanced feed. —*Morris Erdheim, D.V.M.*

▾ ▾ ▾

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"Thyroprotein for Dairy Cattle"

Hormonal influence on growth and milk production have been studied intensively by endocrinologists for many years. Information concerning the influence of secretions of the thyroid gland, thyroxine, have been confusing primarily because of the lack of understanding of not only quantity considered optimal but the influence on glandular secretion when the hormone was provided artifically. Dr. Charles W. Turner, professor of dairy husbandry, University of Missouri, Columbia, explains these matters explicitly. His comprehensive discussion appears in *Feedstuffs,* for Feb. 9, 1957.

Experiment stations throughout the world have been accumulating evidence for 15 years toward evaluation of preparation of thyroxine, called thyroproteins. Results have been variable. Now, according to Doctor Turner, intensive investigations of recent years with an improved product have finally resolved the problem so that the practibility of thyroprotein for dairy cows is clarified. Influence of secretions of the thyroid gland on milk secretion were among the first to be demonstrated. It is now accepted that it is by no means the only one having lactogenic properties.

Thyroxine secretion rates vary widely among individual animals. This characteristic also appears to be an inheritance factor. Further work is in progress at the Missouri station to determine thyroxine secretion rate of calves, heifers, cows, and bulls which will serve as a guide to breeding. If an optimal quantity of thyroxine is secreted supplementation of thyroprotein can not be expected to improve production. Excesses are wasted and that fed and absorbed into the blood stream from the digestive tract serves only to relieve the glands of production function. This explains why less than optimal amounts fed failed to stimulate production in those animals whose thyroid activity was below optimum. That fed merely replaced that secreted.

Doctor Turner likened the practice to thyroprotein supplementation to soil fertilization. Only optimal quantities of each element are used by the crop growing on such fertilized soil. In the absence or deficieny of one element production is limited. He also emphasizes that unless manners of nutrition are considered when feed is supplemented, improved production will not be realized.

Feeding thyroprotein to dairy cows supplies essentially the same hormone as that normally secreted. It can effect change only by making up inherent deficiency of glandular secretion. By providing an optimal level, productivity is improved to the extent that thyroxine deficiency alone had limited productive capacity.

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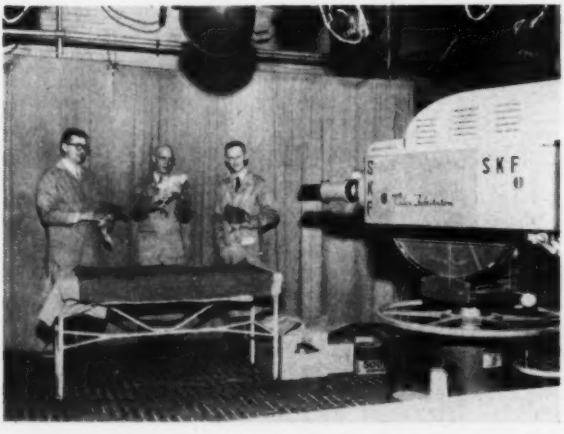

The 57th Annual Conference of Veterinarians sponsored by the School of Veterinary Medicine, University of Pennsylvania, convened at Philadelphia on Jan. 8-9, 1957. Shown (l. to r.) Dr. Morris S. Cover, Poultry Pathologist, University of Delaware; Dr. Evan L. Stubbs and Dr. F. George Sperling, both professors of veterinary pathology of the University of Pennsylvania; preparing to start their closed circuit telecast in color. Television presentations at the Conference were sponsored by Smith, Kline, and French Laboratories, Philadelphia. More than 300 registered attendance.

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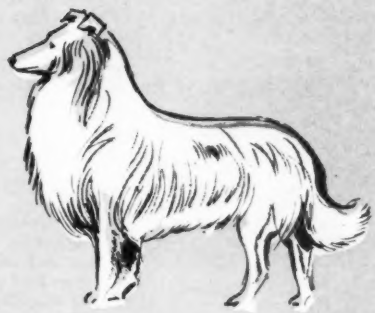

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Dr. George White Succumbs to Long Illness

Dr. George Ronson White, 82, Tennessee pioneer veterinarian, died at his home March 1, 1957, following an extended illness.

Doctor White, founder of the White Animal Hospital and White Serum Co., Nashville, Tenn., also served as city veterinarian for seven years and state veterinarian of Tennessee for six years. He is also author of a number of text books employed widely in veterinary school. Among the best known of his works is Animal Castration. He was author of meat inspection and disease control legislation now on the statutes of his home state.

Dr. White was active in association affairs, serving his state association as president. He was treasurer of the A.V.M.A. from 1905 to 1915.

▾ ▾ ▾

Allergic Reactions

Incidence of allergic reaction to drugs is increasing among the population, according to an editorial in *GP*, as strides are made in therapeutics. Antibiotics, hormones, organ extracts, vitamins, vaccines, antisera, sulfonamides, mercury, aspirin, and many other agents are potent sensitizers. Allergic manifestations vary in intensity from minor unrecognized syndromes to rapidly fatal reactions, many of which are preventable.

The problem of allergy is of increasing importance in veterinary medicine. A host of treatment agents used routinely are potentially hazardous to the well being of patients, and the widespread and continuous use of some drugs for growth stimulation, parasite control, et cetera, must be considered when a regimen of therapy is outlined.

MEETING CALENDAR

Washington State College, School of Veterinary Medicine. Ninth Annual Spring Conference. Pullman, Wash., April 8-10, 1957. Dr. Ray E. Watts, College of Veterinary Medicine, Pullman, Wash.

Northern Illinois Veterinary Medical Association. Semi-annual Meeting. Faust Hotel, Rockford, Ill., April 17, 1957. Dr. James G. Hardenbergh, Rockton, Ill., secretary-treasurer.

North Central Iowa Veterinary Medical Association. Annual Meeting. Warden Hotel, Fort Dodge, April 18, 1957. Dr. H. Engelbrecht, P. O. Box 797, Fort Dodge, Iowa, secretary.

American Animal Hospital Association. Annual Meeting. Palace Hotel, San Francisco, Calif., May 8-11, 1957. W. H. Riser, 5335 Touhy Ave., Skokie, Ill., executive secretary.

Eastern Iowa Veterinary Association. Twenty-third Annual All-day Practitioner's Clinic. Hawkeye Downs, Cedar Rapids, Ia., May 14, 197. Dr. F. E. Brutsman, Traer, Ia., secretary.

Kansas State College. Nineteenth Annual Conference for Veterinarians. School of Veterinary Medicine, Manhattan, Kans., May 26-28, 1957. E. E. Leasure, dean.

School of Veterinary Medicine, Texas A. & M. College. Tenth Annual Texas Conference for Veterinarians. College Station, Texas, June 6-7, 1957. R. D. Turk, conference chairman.

Georgia Veterinary Medical Association. Fifty-first Annual Meeting. Georgia Continuing Education Center, Athens, Ga., June 23-25, 1957. Dr. Chas. C. Rife, secretary.

North Carolina State Veterinary Examining Board. General Meeting. Grove Park Inn, Asheville, N. C., June 24-26, 1957. Dr. James I. Cornwell, 65 Beverly Road, Asheville, N. C., secretary.

Maritime Veterinary Associations Joint Conference. Mount Allison University, Sackville, New Brunswick, June 25-27. Dr. J. F. Frank, Sackville, chairman, Joint Committee.

Maryland State Veterinary Medical Association. Summer Meeting. George Washington Hotel, Ocean City, Md., June 27-28. John D. Gadd, Cockeysville, Md., secretary-treasurer.

Kentucky Veterinary Medical Association. Forty-sixth Annual Meeting. The Brown Hotel, Louisville, Ky., July 15-16, 1957. Dr. Robert H. Singer, 136 Shawnee Place, Lexington, Ky., secretary.

Iowa State College. Annual Conference for Veterinarians. Memorial Union, Iowa State College campus, July 16-17, 1957. M. S. Hofstad, program chairman.

California State Veterinary Medical Association. Sixty-ninth Annual Convention. Hotel Miramar, Santa Barbara, June 17-19, 1957. Charles S. Travers, 3004 16th St., San Francisco, executive secretary.

Canadian Veterinary Medical Association. Ninth Annual Meeting. Hotel Georgia, Vancouver, B.C., July 22-24, 1957. Dr. J. Archibald, Ontario Veterinary College, Guelph, Ontario, vice-president.

New York State Veterinary Medical Society. Annual Meeting. Hotel Statler, Buffalo, N. Y., Sept. 11-13, 1957. Joan S. Halat, 803 Varick St., Utica, N. Y., secretary.

New England Veterinary Medical Association. Twenty-third Annual Meting. Equinax House, Manchester, Vermont, Oct. 6-9, 1957. Dr. J. R. Wadsworth, Dept. of Animal Pathology, University of Vermont, Burlington, Press and Publicity Committee, chairman.

EXAMINATIONS

Florida State Board Examination

The Florida State Board examination will be held June 17-19, 1957 at the Everglades Hotel, Miami. Deadline for applications is June 1, 1957. All inquiries should be addressed to Dr. E. L. Matthews, P. O. Box 141, Palatka, Fla.

▾ ▾ ▾

South Dakota State Board Examination — June 24-25, 1957

The South Dakota State Board Examination, to practice veterinary medicine and surgery, will be given June 24 and 25, 1957. This examination will be the national examination, plus a short informal oral examination.

Applicants should have their applications in the office of the South Dakota Livestock Sanitary Board, Pierre, S. D., on or before May 25, 1957. Each application must be accompanied by a check or money order in the amount of $10. made payable to the South Dakota Livestock Sanitary Board.

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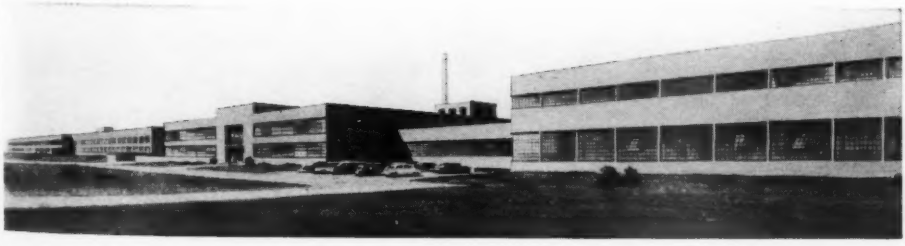

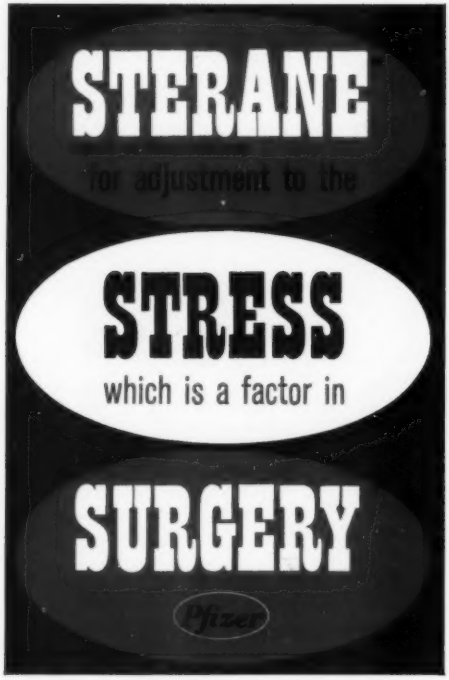

Dr. T. J. Leasure, retiring president of the Kansas Veterinary Medical Association, in his presidential address urged members to join the Kansas Livestock Association.

Advantages of association with livestock groups everywhere greatly exceed their cost and ought to be considered by all practitioners who serve the industry.

▼ ▼ ▼

DEATHS OF VETERINARIANS

Fred J. Bardsley, Northboro, Mass., USC '15, Nov. 1956.

Ralph W. Carmack, Indianapolis, Ind., ONT '05, Sept. 18, 1956.

John W. Childs, Denver, Colo., COL '28, Dec. 1956.

Noble W. Elsbury, Greenfield, Ind., IND '11, died recently.

Alfred E. Erickson, Charlotte, Mich., GR '18, Oct. 19, 1956.

L. R. Montgomery, Casselton, N. Dak., OSU '14, Dec. 14, 1956.

Charles E. Simpson, St. Joseph, Mo., ONT '07, Oct. 27, 1956.

Mitchell J. Smith, San Diego, Calif., WSC '32, Oct. 10, 1956.

Dail Thornburg, Burley, Idaho, COL '41, Nov. 1956.

Earl F. Whipple, Fairport, N. Y., COR '23, Jan. 1957.

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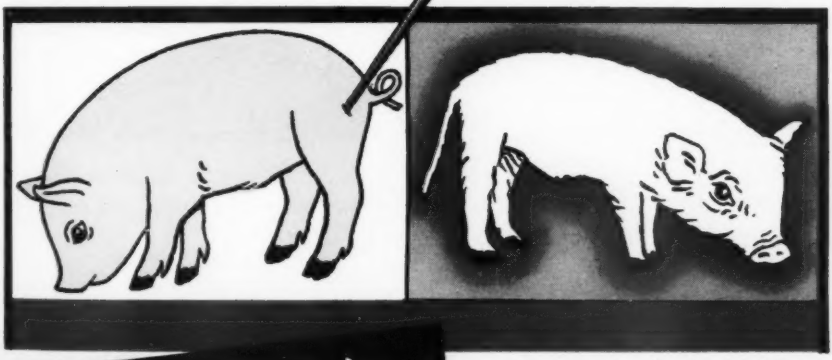

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